

**CULTURES OF LIGHT:  
ELECTRIC LIGHT IN THE UNITED STATES, 1890s-1950s**

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a thesis submitted to Victoria University of Wellington  
in fulfillment of the requirements for the degree of  
Doctor of Philosophy

Victoria University of Wellington

(2016)



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## Abstract

Cultures of Light is set within a period that stretches from the late nineteenth to the mid-twentieth century in the United States, an era in which nearly every aspect of American life was impacted to a lesser or greater degree by the introduction, distribution and integration of electric power and light. By no means attempting to comprehensively examine the impact and effects of this expansive transformation, this thesis has a narrow but meaningful target, defined by key intersections of electric lighting and American culture. Primarily concerned with the investigation of culturally bound ideas and practices as mediated through electric light and its applications, my thesis is focused on particular instances of this interplay. These include its role in supporting nationalizing narratives and agendas through large-scale demonstrations at world's fairs and exhibitions, in the search for and expression of modernism and its variations in the United States. Similarly electricity and electric light throughout the better part of the twentieth century was scaled to the level of the individual through a number of mechanisms and narratives. Most prominently the electric light industry employed gendered discourses, practices and beliefs in their efforts to grow the market, calling upon the assistance of a host of cultural influencers, from movie stars to architects to interior designers, instigating a renegotiation of established approaches to the design of architecture and the visual environment. Connecting common themes and persistent concerns across these seemingly disparate subject areas through the examination of cultural beliefs, practices, rituals and traditions, Cultures of Light seeks to illustrate the deep and lasting significance of electric light within American society in the twentieth century.

## INTRODUCTION

By and large histories of design, architecture, and the built environment have focused on material objects and physical traces of human culture as a means of exploring a variety of subjects and subjectivities. Such a bias towards the physical and material marginalizes the vital role of the non-material in the composition and character of modern societies. This is particularly problematic as modern societies over the last century have increasingly become characterized by both technologies and practices that abstract the material world, communicating or carrying what was once a physical object or physically embodied experience as technologically enabled representation. This transformation through abstraction and reduction is more popularly recognized in reference to photography, radio, and of course digital technologies and computer programming, but it is less commonly associated with the introduction and dissemination of electric light. Inherently abstract, malleable, and communicative, electric light served as a formative influence in the rapid social, cultural, economic and technological development of the United States during the twentieth century, expressing, embodying, and mediating key aspects of American culture. Media theorist Marshall McLuhan suggested the promise of just such an approach in 1964, writing:

Whether the light is being used for brain surgery or night baseball is a matter of indifference...It could be argued that these activities are in some way the 'content' of the electric light, since they could not exist without the electric light. This fact merely underlines the point that 'the medium is the message' because it is the medium that shapes and controls the scale and form of human association and action.<sup>1</sup>

While McLuhan used electric light in this analogy as an illustration of his concept, my thesis takes electric light as its principle focus, examining it as "medium" through which particular aspects of American culture may be meaningfully reconstructed, read and understood.

Furthermore, as a counterpoint to McLuhan, I argue that whether electric light was used for

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<sup>1</sup> Marshall McLuhan, *Understanding Media: The Extensions of Man* (New York: Signet Books, 1964), 23-24.

brain surgery or night baseball is indeed a matter of some importance, and that understanding how, when, and why electric lighting was employed is critical in appreciating and reading its “content”. While neither brain surgery or night baseball appear as case studies in my thesis, a number of others do, each of which was chosen for its relevance and prevalence during key chronological periods stretching from the later nineteenth century with the introduction of electric light, through the turn of the twentieth century and the early articulations of modernism, to the 1920s and the development of machine age rhetoric and aesthetics, and finally, to the 40s and 50s and the blossoming of suburban consumer culture and its intense focus on the American home and family. Running parallel to this are a number of themes, some of which come into particular focus at key points in time and others which remain more constant and consistent concerns over this extended period—most prominently associations of electric light with progress, modernity, and cultural or economic value or achievement, as well as with new and evolving theories of abstraction and the tenets of modern architecture and aesthetics. Indeed, from its introduction in the United States in the later nineteenth century, electric light was symbolically and ideologically closely linked to the core characteristics identified with American national identity, and as such, were widely utilized in the popular expression and representation of these ideals. Electric light, unlike any illumination typology that had come before, was simultaneously modern, technological, scientific measured, engineered for efficiency and task-tailoring. Importantly, it also was abundant and seemingly limitless; conditions that also facilitated the association of electric lighting with such experiential properties; dazzling, magical, spectacular, beautiful, and sublime. Bounding the diversity of these frameworks and narrative vectors, *Cultures of Light* identifies points of intersection with key moments in the development and dissemination of electric light, examining the ways in which the compounding of these forces impacted American culture and cultural production in the twentieth-century, sketching out the



foundation of a history of electric light in the USA one that is simultaneously social, cultural, political, and economic.

### **Methodology**

Like electric light itself, my research does not sit easily in one discipline, and has benefited from the consideration of a number of better-known and recognized histories and methodologies over an extended period of doctoral study, which began at the Bard Graduate Center in New York City in 2005 and has continued through to my candidacy at Victoria University of Wellington beginning in 2014. Over the course of this research project, I have established a methodological approach grounded in an art historical practice, but broadly drawing upon related and relevant historical approaches, including architectural history, design history, and histories of the interior, as well as material culture, media and gender studies. Examining where and how electric lighting intersected with popular, professional, and industry discourse and practice, this project explores its relevance to key aspects of the broader historical development of American culture, drawing upon an extensive body of period publications, including but not limited to newspapers, popular magazines, trade and professional journals, and advice literature, as well as select archival materials.<sup>2</sup> As there is limited secondary scholarship addressing the scale and scope of my study, my research relies most heavily upon period sources and the analysis and contextualization of these texts in relation to relevant secondary sources. Where possible I interpret these findings with the aid of established theoretical frameworks, particularly those helpful in understanding issues of gender, technology, and nineteenth and twentieth-century American culture.<sup>3</sup> An unresolved

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<sup>2</sup> Consulted collections included, the Richard Kelly Papers (1909-1981) and Stanley Russell McCandless Papers (1920-1985) at the Sterling Memorial Library, Manuscripts and Archives collection, Yale University.

<sup>3</sup> Useful frameworks have included, on American material culture: Jules David Prown, "Mind in Matter: An Introduction to Material Culture Theory and Method," *Winterthur Portfolio*, 17, 1 (Spring, 1982): 7-10; Warren I. Susman, *Culture as History: the Transformation of American Society in the Twentieth Century* (Smithsonian Institution, 2003); and Simon J. Bronner, ed., *Consuming Vision: Accumulation and Display of Goods in*

challenge of my research however, has been the lack of individual or personal accounts of the reception of electric light, particularly so in terms of accounts provided by individual consumers in response to the promotional efforts of the electric industry or the applications of electric lighting as described in advice literature, architectural journals, and popular design discourse. Given the lack of primary evidence in this area, my research focuses on the mechanisms utilized in the promotion and domestication of electric light rather than its reception. Therefore, a primary aim of *Cultures of Light* is to expose the ways in which those promoting the use of electric light appropriated existing cultural beliefs and practices to situate new applications of electric light as both familiar and necessary.

A number of historians have contributed to the development of a body of scholarship addressing artificial lighting including, most prominently David Nye, Wolfgang Schivelbusch, John Jakle, and Dietrich Neumann, as well as a number of scholars who have

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*America, 1880-1920* (New York: W.W. Norton & Company, 1989). On gender, beauty, feminine identity, and postwar domestic roles, politics, and consumption: Judy Attfield and Pat Kirkham, *A View from the Interior: Feminism, Women, and Design* (Women's Press, 1989); Sarah Berry, "Hollywood Exoticism: Cosmetics and Color in the 1930s," in *Hollywood Goes Shopping*, ed.s, David Dresser and Garth S. Jowett (Minneapolis: University of Minnesota Press, 2000), 108-138; Victoria de Grazia, ed., *The Sex of Things: Gender and Consumption in Historical Perspective* (Berkeley: Univ. of California Press, 1996); Beverly Gordon, "Woman's Domestic Body: the Conceptual Conflation of Women and Interiors in the Industrial Age," *Winterthur Portfolio*, vol. 31, no. 4 (Winter, 1996): 281-301; Karen Halttunen, "From Parlor to Living Room: Domestic Space, Interior Decoration, and the Culture of Personality," in *Consuming Visions: Accumulation and Display of Goods in America 1880-1920*, ed. Simon J. Bronner (New York: W.W. Norton & Company, 1989): 157-190; Joanne Meyerowitz, "Beyond the Feminine Mystique," in *Not June Cleaver: Women and Gender in Postwar America, 1945-1960* (Philadelphia: Temple University Press, 1994); Kathy Peiss, *Hope in a Jar: the Making of America's Beauty Culture* (University of Pennsylvania Press, 2011); and Penny Sparke, *As Long as it's Pink: The Sexual Politics of Taste* (London: Pandora, 1995). On mid-century glamor and aesthetic culture: Alice Friedman, *American Glamour and the Evolution of Modern Architecture* (New Haven: Yale University Press, 2010); and Stephen Gundle, "Hollywood Glamour and Mass Consumption in Postwar Italy," *Journal of Cold War Studies* 4, no. 3 (Summer, 2002): 95-118. On issues of gender, race, and class in the United States during the nineteenth and twentieth centuries see, Gail Bederman, *Manliness and Civilization: A Cultural History of Gender and Race in the United States, 1880-1917* (Chicago: University of Chicago Press, 1995); Gillian Brown, *Imagining Self in Nineteenth-Century America* (Berkeley: University of California Press, 1990); Richard Dyer, *White* (New York: Routledge, 1997); and Joan W. Scott, "Some Reflections on Gender and Politics," in *Revisioning Gender*, eds., Myra Marx Ferree, Judith Lorber, and Beth Hess (Walnut Creek, CA: Altamira Press, 2000), 70-98. On women and the history of business, see Alice Kessler-Harris, "Ideologies and Innovations: Gender Dimensions of Business History," *Business and Economic History* 20 (1991): 45-51; and Wendy Gamber, "Gendered Concerns: Thoughts on the History of Business and the History of Women," *Business and Economic History* 23 (Fall 1994): 139-40; Regina Lee Blaszczyk, *Imagining Consumers: Design and Innovation from Wedgwood to Corning* (Johns Hopkins University Press, 2000).

contributed smaller, more specialized studies.<sup>4</sup> The diversity of these studies hints at the great scope of scholarship on electric light—subjects such as the development and demise of neon signs in the USA, the symbolism of electric lighting in the film noir genre, the new scotopic space produced by headlights as well as blackouts and what happens when the lights are turned off, new roles for women in the development and promotion of electric lighting applications, the class implications of residential Christmas lighting displays, and many other fascinating investigations.<sup>5</sup> However, and to the detriment of the advancement of this area of scholarship, these studies remain largely disconnected, and more recognizable as subsets of the particular disciplinary associations of their authors. This presents a challenging situation for the scholar who wishes to contribute to the history of artificial light, even if one narrows this field further to electric lighting in the United States during the twentieth century. My thesis seeks to address this situation, making an argument for the value and benefit of examining electric light as holistically as possible and as a recognizable and constituent aspect of twentieth-century American culture.

Synthesizing analysis of existing scholarship addressing the uses and meanings of electric light in the United States with a broad range of period materials, my study situates and contextualizes electric lighting within a network of beliefs, practices, events, and conditions and a period of swift social, political, economic, and environmental transformation. Indeed, between the late nineteenth century when a small group of ambitious

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<sup>4</sup> John Jakle, *City Lights: Illuminating the American Night* (Baltimore: Johns Hopkins University Press, 2001); Dietrich Neumann, and Kermit Swiler Champa, eds., *Architecture of the Night: The Illuminated Building* (Munich; London: Prestel, 2002); David Nye, *Electrifying America: Social Meanings of a New Technology* (Cambridge, Mass.: MIT Press, 1992); Wolfgang Schivelbusch, *Disenchanted Night: the Industrialization of Light in the Nineteenth Century*, trans. Angela Davies (Oxford: Berg, 1988).

<sup>5</sup> See, Patrick Keating, "Film Noir and the Culture of Electric Light," *Film History*, vol. 27, no. 1 (2015): 58-84; Christoph Ribbat, *Flickering Light: A History of Neon* (London: Reaktion Books, 2013); Thomas E. Rinaldi, *New York Neon* (New York: W.W. Norton & Company, 2012); Sandy Isenstadt, "Auto-Specularity: Driving through the American Night" *Modernism/modernity* 18, no. 2 (2011): 213-231; Sandy Isenstadt, "Groping in the Dark: The Scotopic Space of Blackouts," *The Senses and Society* 7, no. 3 (2012): 309-328; Carolyn Goldstein, "From Service to Sales: Home Economics in Light and Power, 1920-1940," *Technology and Culture* vol. 38, no. 1 (Jan., 1997): 121-152; Tim Edensor and Steve Millington, "Illuminations, class identities and the contested landscapes of Christmas," *Sociology*, vol. 43, no. 1 (2009): 103-121.

entrepreneurs and engineers developed the technology and infrastructure required to make the production and distribution of electric power and light feasible, to General Electric and Westinghouse's monopolistic control of the entire industry by the early 1910s, to the eventual infiltration of electric light into nearly all areas of American life and culture by the mid-twentieth century, the United States rose to prominence as a global military and economic power.<sup>6</sup> Not unconnected, in this period national leaders in both government and industry actively sought to define and promote a national identity for the United States that would clearly distinguish the young country in an increasingly global political environment. Despite the great diversity of voices and interests contributing to the discourse on national identity, technological innovation, pragmatism, and the harnessing of natural resources were consistently invoked as characteristically American (and indicative of intrinsic strengths). These characteristics were also often linked to Darwinian notions of cultural progress, and an ethos that prized democratic governance and personal and political freedoms. In the first half of the twentieth-century particularly, these characteristics were leveraged in support of capitalism and the promotion of a culture and polity driven by consumers and consumption, a situation resulting in a nearly seamless conflation of democratic freedom, material abundance and consumer citizenship in the mid-twentieth century.<sup>7</sup> Importantly, as my thesis argues, electric light was used in a number of ways to symbolize and express these characteristics and therefore became deeply wedded to the very definition of American national identity.

Of central interest to this project is the methodology of material culture, which according to historian Jules Prown allows "the study through artefacts (things) of the beliefs—values, ideas, attitudes, and assumptions—of a particular community or society at a

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<sup>6</sup> "Electrical Trust Under the Probe: Unlawful Combination and Conspiracy Charged," *The Atlanta Constitution*, March 4, 1911; on this see also, Jill Jonnes, *Empires of Light: Edison, Tesla, Westinghouse, and the Race to Electrify the World* (Random House Trade Paperbacks, 2004); Richard Munson, *From Edison to Enron: the Business of Power and What it Means for the Future of Electricity* (Westport, CT; Prager Publishers, 2005).

<sup>7</sup> Lizabeth Cohen, *A Consumers' Republic: The Politics of Mass Consumption in Postwar America* (New York: Vintage Books, 2003); Susan Strasser, *Satisfaction Guaranteed: The Making of the American Mass Market* (New York: Pantheon, 1989).

given time.”<sup>8</sup> While electric light—as electric energy harnessed to produce visible light—is not generally understood as an artifact in the same sense as an object, or product, or building, it is an equally useful lens for studying the values, ideas, attitudes and assumptions of a particular community of society. While the widespread adoption of electric light has had a significant impact on the appearance of the built environment in the United States during the twentieth century, an error could be made by focusing too closely on such aspects, which only reveal a fraction of its larger influence on and engagement with American culture during the twentieth century. Seeking to capture a cultural history of electric lighting, my thesis argues that it is not a singular artifact or entity, but a medium—as McLuhan suggested—that has drawn and produced meaning across an exceptional spectrum: from urban-scaled representations of notions of progress and national identity, to explorations of the aesthetic characteristics of modernism and abstraction, to professional considerations and debates regarding the design of the built environment and the balance of science or art in such efforts, to notions and definitions of the American standard of living, and to negotiations of the individual and gendered issues of personal identity and social agency. The medium of electric lighting at different times in the twentieth century served as both a container and conduit for these cultural questions and concerns, discourses and debates, beliefs and practices—sometimes simultaneously and sometimes sequentially. While I have purposefully narrowed the focus of *Cultures of Light* to areas that clearly illustrate these themes, there is hardly an aspect of modern American culture that electric lighting has not impacted to some degree, and it is not my intention to attempt to represent or capture the whole of this history. However, it is my aim to make an argument for the relevance of a greater, broader field of inquiry supporting cultural histories of electric light and the potential contributions of such research to the scholarly record.

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<sup>8</sup> Prown, “Mind in Matter,” 1.

Nye, arguably the most widely published historian of electrification in the United States has observed that, “the meaning of illumination is not a matter of functionality but of culture.”<sup>9</sup> His proposition is, in many ways, the main tenet of my thesis. However, I believe such a position requires some qualification. The powerful simplicity of Nye’s statement belies the complexity of both the making and reading of such culturally bound meanings and the histories from which they are gleaned. Instead, my thesis posits that there are multiple, concurrent meanings of electric light, and that each meaning corresponds to diverse factors, which include the cultural and historical context of a particular application, its function or functionality in that context, its relationship to existing or new practices, beliefs, and discourses, and who or what discipline is involved in exploring its use and uses, as well as a wide range of secondary and more specialized concerns and conditions. Therefore, I have structured and developed my thesis to avoid such binaries, by analyzing a cross section of factors, forces, and contexts intersecting with a range of uses and expressions of electric lighting, thereby revealing the points at which the complexity of these interrelations are at their richest.

### **Chapter Overview**

Building upon the great body of scholarship addressing world’s fairs and expositions, Chapter 1—Narratives of Progress explores the role of electric light in articulating didactic, nationalizing narratives at United States fairs held between the later nineteenth and early twentieth centuries. Furthermore, its use in the mass communication of such narratives also contributed to the conditioning the attitudes of American to the reception of electric light and the priming of consumer market for electric light more generally. Focused upon a period bookended by Chicago’s World’s Columbian Exposition of 1893 and San Francisco’s

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<sup>9</sup> David Nye, “Forward,” in *Cities of Light: Two Centuries of Urban Illumination*, eds., Sandy Isenstadt, Margaret Maile Petty, and Dietrich Neumann (New York: Routledge, 2015), xx.

Panama-Pacific International Exposition of 1915, it examines the ways in which electric lighting was employed by fair sponsors, organizers, and designers to embody and express ideological objectives. Most significant among such intentions were those related to spectacular demonstrations of electric lighting, which were cast by fair organizers and the electric industry as symbolic of America's growing technological and cultural preeminence as a modern industrialized nation. Calling attention to the privileging of such narratives in the planning, design, and nightly staging of dramatic large-scale electric light shows at American fairs during this period, Chapter 1 explores the ways in which these displays were contextualized within the popular discourse on American ingenuity and technological progress, as well as evolutionary frameworks reinforced by contemporary racial hierarchies.

Examining a select group of highly influential American fairs held during this period, *Narratives of Progress* illustrates how architectural and spectacular electric illumination was used to portray electrification as indivisible from cultural progress, thereby establishing both a powerful visual vocabulary and body of rhetoric useful in supporting the aims of the government and industry. Looking closely also at the involvement of the electric industry in the presentation and representation of electricity and electric light at American fairs, Chapter 1 foregrounds the extensive influence of General Electric on the use of electric lighting at these fairs, as well as those who designed these large-scaled spectacles. While such influence was made possible by the company's monopolistic hold over the technology and resources of the electric industry in the USA, the artistry and innovation realized in the lighting of these fairs was also a result of G.E.'s support of three generations of illuminating engineers and investment in their research—another important aspect of Chapter 1. The industry agenda that supported, and in many ways drove, the prominent and symbolic role of electric lighting at American world's fairs provides an important foundation for key themes that are carried through and developed in the following chapters, including the scaling and orientation of

electric light to American consumers on an individual and personal level (Chapter 3), the codification of the methods, language, and professional practices of illuminating engineers (Chapter 4), and the promotion of electric light as modern ornament, as a powerful aestheticizing agent within the built environment (Chapter 2). Indeed, an essential context in establishing frameworks for many of the uses and meanings of electric lighting in twentieth-century American culture, Chapter 1 locates, if not the origins, key nodes in the early history of electric lighting in the United States where the major themes of this study become culturally prominent on a national scale, including the wedding of American identity to the production of electricity and the mastery of natural resources, the rhetorical linking of ideological notions of cultural progress and modernity to the catholic consumption of electricity, the emergence of the profession and practice of illuminating engineering, and the codification of modern aesthetic vocabulary informed by lighting techniques introduced and experimented with at these fairs.

Building chronologically and thematically from Chapter 1, *Invisible Mechanisms of Modernism*—Chapter 2, sets out the context for the dissemination, popularization, and domestication of electric light and argues for its formative role in the development of modernist discourse and practice in the United States during the first three decades of the twentieth century. The vast range of luminous effects demonstrated at the 1915 Panama-Pacific Exposition offered exciting possibilities for designing with indirect, reflected, and projected electric lighting applications. This new abstracted, vocabulary of light played a central role in a number of influential reconsiderations of the nature of modern art, theater, design, architecture and life in both Europe and the United States during this period. While Chapter 2 is largely concerned with the adaptation of electric light by those loosely fitting within the modernist avant-garde in the United States and Europe, these ‘high cultural’ experiments into the aesthetic possibilities of indirect illumination, situated electric lighting



more generally within American popular culture as glamorous, sophisticated, and modern (Chapter 3). *Invisible Mechanisms of Modernism* traces this discourse, looking across its breadth, as well as at the beliefs and practices that informed the development of a host of new lighting applications and effects that greatly impacted the articulation and imaging of modern architecture and interiors.

Establishing a context for the emergence of a theoretical and aesthetic framework for modernism in the United States, Chapter 2 draws upon a diversity of popular, professional, and industry literature addressing the introduction of electric light and promoting its advantages as compared with gas and other flame-based illuminates—most commonly its ability to provide precise, scientific control and manipulation of light quality and effect, as well as the overall enhancement of the visual environment. From researchers at General Electric's laboratories, to new stagecraft designers, architects, industrial and interior designers, and a host of cultural critics, electric light was explored as a new means of radically re-shaping space, experience, and perception. Such enthusiasm for electric light dovetailed with the growing influence of modernism and the increasing engagement of a number of prominent individuals in Britain, Europe, and United States in negotiating its tenets. Concurrently attending to the challenges presented by modernism's jettisoning of ornament—such as how to communicate architectural intent, cultural hierarchies and economic value, visual interest, character and aesthetic refinement—a new and perhaps previously unrecognized role for electric lighting in fulfilling these objectives was identified. Across a variety of disciplines, including illuminating engineering, architecture, and arguably most influentially, theater stagecraft, new electric lighting applications were explored and held up as evidence of the potential for new technologies to reforming old design practices. These investigations would play a key part in the articulation of a modernist agenda in the USA, adapting aspects of European avant-garde theory and practice to the particular

conditions of American culture during the interwar period. In the postwar period, the lighting industry simplified many of these experimental or bespoke applications of electric light for the mass market, translating them into forms compatible within everyday practices and budgets, and in some instances layering them with gendered language and expectations to develop new markets and users for electric lighting (Chapter 3).

Such translations form the primary focus of Chapter 3, *Gendered Discourses and Practices*, providing additional lenses on the many challenges of negotiating the shift from flame-based to electric illumination in the later nineteenth century, this time calling into focus the context of the domestic environment and middle class American everyday practices. Within this broader context, Chapter 3 gives special attention to the ways in which American industry endeavored to integrate electric lighting into a range of women's roles, responsibilities and practices, including personal beauty, social performance, and the design and maintenance of the domestic environment. Identifying continuities that linked concerns regarding the use of artificial light in the pre-electric era and the altering of the appearance of people, colors, and interiors under its effects, Chapter 3 illustrates the continuity of such issues, examining how the discourse addressing these issues quickly integrated the new technology of electric light as a solution to these vexing problems.

From this historical context, Chapter 3 situates the emergence of a new consumer discourse of electric lighting within the dramatic reformulation of the American economy that occurred during the 1930s, and the concomitant recalibration of American citizenship as defined by consumer activity. In this period, Americans called for assurances from the government for a stable standard of living, one indicative of the wealth and abundance of the nation, rather than for greater political representation. The democracy of the marketplace also provided women with new personal and professional opportunities, as well as increased economic power and social agency. Exploring both the opportunities and challenges that

women faced in relation to the growing influence of American consumer culture during the 1930s, Chapter 3 examines the ways in which the industry presented and promoted electric lighting as a means of addressing a host of gendered concerns from color coordination and harmony in the decoration of the home to new standards and regimes for personal beauty. Across the emerging discourse of gendered electric lighting, increasing emphasis was given to the expression of personality in the design of domestic interiors and in the composition of one's own appearance, in the creation of pleasing environments for entertaining guests, and more generally in the care and maintenance of the home and family. Building upon existing literature concerning gender and women's roles within the domestic sphere, Chapter 3 situates electric lighting within this scholarship, demonstrating the ways in which the electric industry coopted key cultural beliefs, assumptions and practices in the promotion of electric light to women consumers.

Also examining the influence of women within the electric industry, Chapter 3 calls attention to their contributions to the development and promotion of electric lighting applications for the home, exploring the diversity of their roles—within industry or the home—as consumers and homemakers, advice columnists and beauty experts, interior decorators and home economists, as well as consultants and residential lighting specialists—which connects more broadly to the historical development of lighting design in the USA (Chapters 1 and 4). As both subjects of and contributors to reformulations of gendered discourses and practices that embraced a great diversity of applications of electric lighting particularly tailored to the concerns of American women during the interwar period, Chapter 3 illustrates the increasing prevalence of electric lighting applications in the discourse of everyday practices, from advice governing women's social roles and obligations as homemakers to the maintenance and protection of their homes, families, and the American standard of living.

While the development of lighting industry and illuminating engineering in the United States serves as a central theme in each of the first three chapters, Chapter 4, *The Science and Art of Lighting*, brings these thematic trajectories together, illustrating the deep interconnection of the cultural meanings and uses of electric lighting with the ambitions and actions of the lighting industry and the engineers and designers that translated illumination technology into human needs and values. Tracing the complex historical development of the discourse and practice of professional lighting design, Chapter 4 gives special attention to the problematic and persistent “chasm between architects and illuminating engineers” over the design and use of electric light in architecture throughout the first half of the twentieth century.<sup>10</sup> Beginning with the founding of the Illuminating Engineering Society (IES) and the establishment of broad professional criteria for its membership, Chapter 4 juxtaposes the Society’s efforts to advance the science of electric lighting with the cautious engagement of some members with aesthetic considerations. Establishing the terms of this debate in 1907, first from the point of view of the architect, and shortly thereafter in rebuttal, from the point of view of the illuminating engineer, in the final chapter I explore the forces and voices contributing to and shaping this discourse and the sustained tensions regarding the architectural integration of electric lighting—most particularly, how, when, and where it was to be included and considered within the design process, and importantly, by whom.<sup>11</sup> Focusing on such key points of contention, *The Science and Art of Lighting* illustrates much more than a struggle for professional control over the design and appearance of modern architecture, analyzing the effects of the forced marriage between these two disciplines and its influence within both the popular consumer context (as in Chapter 3) and in the increasingly elite realm of corporate America, where the eventual reconciliation of these

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<sup>10</sup> Tyler Stewart Rogers, “Light-Minded Architecture,” *Transactions of the Illuminating Engineering Society*, vol.31, no. 6 (June 1936): 576-582, quote on 581.

<sup>11</sup> “Electric Light as Related to Architecture,” *Journal of the Society of Architects*, vol.1, no.6 (April, 1908): 236-238; and Bassett Jones, Jr., “The relation of Architectural Principles to Illuminating Engineering Practice,” *Transactions of the Illuminating Engineering Society* vol. 3, no. 1 (Jan., 1908): 9-65.

opposing forces dramatically impacted the appearance of modern architecture in the United States during the postwar period.

Examining the efforts of a number of individuals in defining the terms and conditions of a new professional practice focused on the use of light in the design of the visual environment, Chapter 4 offers new insights into the development of lighting design in the later twentieth century, connecting key issues, influences, and individuals introduced and discussed in the first three chapters, including the theories and practices of modern theatrical stagecraft, the codification of a particular expression of modernism in the United States that merged 'high culture' machine aged rationalism with the 'low culture' indulgence of the consumer market in a widespread, if unified project to aesthetically enhance American cultural production—from cities to architecture to exhibitions to interiors and even individuals. Analyzing the writing and work of a number of individuals—from engineering, architecture, theater, design and the arts—Chapter 4 examines the ways in which they influenced the formulation of new methods and approaches, as well as areas of professional interest and concern within both architecture and lighting design. Providing continuity across this diverse and at times loosely connected community, was a persistent revisiting of old issues, tensions, and prejudices that ultimately, contributed to the development of practices and professions that have significantly impacted the design, appearance, and experience of the built environment in the United States during the twentieth century.

Through the identification and analysis of such persistent themes and key points at which they intersect or overlay one another, *Cultures of Light* offers not only a broad overview of the introduction, dissemination, and popularization of electric light in the United States, it also provides valuable insights into the ways in which the technology of electric light was introduced, repurposed, and translated to convey a range of cultural beliefs and to encourage specific behaviors and practices. The priming and conditioning of popular

attitudes towards electric light through grand luminous spectacles at American world's fairs was reinforced through more personal spectacles of consumption. Fairgoers not only witnessed nightly illuminated spectacles, but also new forms of street lighting, lighting for the factory, home, and a host of other electrically enabled domestic conveniences. The symbolic expression of American national identity through electric lighting and the conspicuous consumption of electricity communicated deep associations with the democratizing forces of technological progress and the free market.

Similarly, the confluence of the elevation of industry's innovations in the United States along with the desire to define American cultural production as equivalent to or surpassing that of Europe, created a unique position for electric light and the broad range of effects it could produce in the defining of a modern aesthetic particularly suited to the American context. By the 1920s and 30s, architects, designers, artists and others among the cultural elite, were adapting aspects of European rationalism to create a more forgiving and commercially viable vocabulary, employing electric light to enhance and exaggerate the sheen, gleam, and surface-bound beauty of 'machine age' architecture, interiors, objects, and materials.

— As the American national narrative became increasingly informed by consumer practice and labour as a means to purchasing power, the definition of modernity in the United States became closely associated with the pairing of efficiency and convenience first and foremost, but also with personalized glamour and easy sophistication accessible through consumer culture and practices. In the postwar period such narratives focused on the nuclear family and the notions of comfort, abundance and customisation, with the woman as a key consumer responsible for the home and family. Again electric lighting, associated with technological innovation, ease, efficiency, and modernity since its introduction, was readily adapted to the demands of the American domestic landscape. Instead of making the products

of industry beautiful, in this context electric light was presented as a way to make the home, its interiors and inhabitants more attractive, enjoyable, and enviable.

The steady hold of the monopoly controlling the electrical industry in the United States contributed significantly to the rapid and agile movement of electric light across a wide spectrum of American culture during the first half of the twentieth century. With a multi-pronged strategy embracing municipalities, corporations, developers, home owners, and individual consumers, industry recruited and supported a range of new specialists and professionals to ensure that electric light became a backdrop and medium for modern American culture. Examining how and where this strategy created collisions between established and emerging disciplines and practices, such as architecture and illuminating engineering, affords new insights into the fraught co-development of the modern built environment in the United States. Furthermore, in looking closely at the interests and efforts of industry to grow the American market for electric lighting, we return to a number of issues, ideas, and individuals introduced earlier in the study, connecting these important points in the development of the nation's cultures of light from immaturity to maturity.

## CHAPTER 1: NARRATIVES OF PROGRESS

### Introduction: Symbolic Universes

Beginning in the mid-nineteenth-century, the production and distribution of electricity contributed to the radical, upward transformation of a broad swath of human civilization, destabilizing political, cultural, and economic order in the industrialized world. This was a fortuitous revolution for the United States. Just over a hundred years old when central power stations were first introduced, the United States was a big, ambitious, and newly independent country with tremendous natural resources and little shared history to build upon. The quick rise of industry and its machinery within the United States was greatly accelerated by the introduction of electric power, bringing about a range of efficiencies in shop organization, power delivery, and manufacturing output.<sup>12</sup> As a key driver in the nation's rapid rise as an industrial and economic global power, electricity and its most easily recognized expression, electric light, became a central leitmotif in the creation of symbolic narratives of national identity and mythology, which were enacted through large-scale demonstrations at United States' world's fair and expositions from the later nineteenth-century through the first decades of the twentieth-century. While the use of electric light and luminous spectacles as a means of conveying symbolic national narratives certainly was not unique to the United States in this period, the way in which the technological spectacle of eclectic illumination so closely suited the particular cultural and historical orientation of this young nation was. As will be explored through a series of case studies in this chapter, at American world's fairs and expositions, electric light served a role that extended well beyond technological spectacle or aesthetic triumph, bridging Republicanism with a technological sublime predicated on the

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<sup>12</sup> Warren D. Devine, Jr., "From Shafts to Wires: Historical Perspective on Electrification," *Journal of Economic History* vol. 43, no. 2 (Jun., 1983): 347-372.



elevation of American engineers and inventors to national icons. The display and promotion of American technology and industrial innovation at world's fairs and expositions has been broadly examined as a significant factor in the positioning of the nation as highly technologically advanced and therefore, "civilized." Despite the centrality of electric light in the symbolic expression of such narratives in the USA, it has remained a minor (at best) aspect in histories of American fairs. Historian Robert Rydell has published extensively on the didactic and imperial objectives of America's world's fairs in the nineteenth and twentieth centuries, yet has given little attention to the role of electric lighting displays in the construction or communication of these objectives.<sup>13</sup> However the frameworks Rydell and others have put forward for studying and understanding the social, cultural, political and economic complexity of world's fairs and exhibition are highly useful in analyzing and interpreting the didactic and symbolic function of spectacular displays of electric light in the context of such regionally, nationally and internationally significant events.<sup>14</sup>

Over the last 25 years a number of historians and scholars have given considerable attention to the world's fairs held in the United States beginning in the nineteenth century and continuing through the first-half of the twentieth century.<sup>15</sup> A common subject among these studies is the role of American expositions in the production of specific cultural, political, and economic models for the United States as a world leader.<sup>16</sup> Much of this research has

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<sup>13</sup> Robert W. Rydell, *All the World's a Fair: Visions of Empire at the American International Expositions, 1876-1916* (Chicago: University of Chicago Press, 1987).

<sup>14</sup> Robert W. Rydell, *World of Fairs: The Century-of-Progress Expositions* (Chicago, Ill.: University of Chicago Press, 1993); Robert W. Rydell, John E. Findling, and Kimberly D. Pelle, *Fair America: World's Fairs in the United States* (Washington [D.C.]: Smithsonian Institution Press, 2000).

<sup>15</sup> Burton Benedict and Robert H. Lowie, *The Anthropology of World's Fairs: San Francisco's Panama Pacific International Exposition of 1915* (Berkeley; London: Lowie Museum of Anthropology; Scolar Press, 1983); Tony Bennett, *The Birth of the Museum: History, Theory, Politics* (London; New York: Routledge, 1995); John E. Findling, *Chicago's Great World's Fairs, Studies in Design and Material Culture* (Manchester; New York: Manchester University Press; St. Martin's Press, 1994); John E. Findling and Kimberly D. Pelle, *Historical Dictionary of World's Fairs and Expositions, 1851-1988* (New York: Greenwood Press, 1990); Karal Ann Marling, *Blue Ribbon: A Social and Pictorial History of the Minnesota State Fair* (St. Paul: Minnesota Historical Society Press, 1990); Rydell, *All the World's a Fair*; Rydell, *World of Fairs*; Rydell, Findling, and Pelle, *Fair America*.

<sup>16</sup> Rydell, Findling, and Pelle, *Fair America*, 5-10.

focused on examining the ways in which American world's fairs and expositions reinforced imperialist notions, definitions of cultural progress, and nationalistic attitudes.<sup>17</sup> The “symbolic universe” is one of the most often cited concepts employed by scholars studying world's fairs and seeking to understand the social and cultural underpinnings and impact of these events. First set forth by the sociologists Peter L. Berger and Thomas Luckmann in 1966 in *The Social Construction of Reality*, the notion of the symbolic universe is predicated upon the belief that any individual's experience and knowledge of the world is to a greater or lesser degree socially constructed.<sup>18</sup> Building upon this fundamental understanding of human experience, the symbolic universe serves a “structure of legitimation that provides meaning for social experience, placing all collective events in a cohesive unity that includes past, present, and future.” In this definition particular significance is assigned to the symbolic future, in that it establishes “a common frame of reference for the projection of individual actions.” Therefore, the central aspect of the construction of this symbolic universe, as Berger and Luckmann explain, is the ability to link man “with his successors in a meaningful totality, serving to transcend the finitude of individual existence...All members of society can now conceive of themselves as belonging to a meaningful universe, which was there before they were born and will be there after they die.”<sup>19</sup>

As applied to world's fairs, the concept of the symbolic universe allows for a reading of these ephemeral exhibitions as carefully constructed and narrated models of idealized societies. Far from an American phenomenon, international expositions were hosted by all of the major industrialized nations of the era—Britain, France, Germany, Italy, Spain, the Netherlands, Denmark, Japan, Australia, and others.<sup>20</sup> Countries with the financial and

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<sup>17</sup> Rydell, *All the World's a Fair* and, Rydell, Findling, and Pelle, *Fair America*.

<sup>18</sup> P. L. Berger and T. Luckmann, *The Social Construction of Reality: A Treatise in the Sociology of Knowledge* (New York: Anchor Books, 1967).

<sup>19</sup> Berger and Luckmann, 92-108. Also quoted in Rydell, *All the World's a Fair*, 2-3.

<sup>20</sup> The most comprehensive reference source on international world's fairs and expositions remains, John Findling and Kimberly D. Pelle, *Encyclopedia of World's Fairs and Expositions* (McFarland, 2008).

political resources necessary to host an international exhibition were afforded a unique opportunity to present a managed and ordered view of the world to visitors that encoded particular cultural messages regarding race, nationality, technological progress, national resources and imperial prowess. In a period characterized by a rapidly changing global environment, increasing international trade, massive technological advances, industrialism and imperialism, world's fairs enabled nations controlling significant resources to turn such disruptions into purposeful and nationalizing narratives, shoring up traditional beliefs and validating economic and political policies central to the continued growth and viability of governing parties and classes. As Rydell argues, world's fairs represented the efforts of political, scientific, and industrial leaders to shape and present a symbolic universe that confirmed and extended the authority of these governing bodies to the growing middle classes.<sup>21</sup>

Burton Benedict, like Rydell, invokes the concept of a constructed symbolic universe in *The Anthropology of World's Fairs*, but he places greater emphasis on the performance of social rituals in the creation of this cohesive unity. Comparing world's fairs to Northwestern American native tribal potlatches, Burton suggests that both “occur in societies preoccupied with rank and the prestige that rank implies. In these sorts of societies rank is validated by large-scale display of goods” as well as the performance of “entertainments, courtesies, and rituals.” The commonalities between potlatches and the world's fairs as Benedict describes, illustrate the social cohesion provided by such gatherings and rituals. Importantly, Benedict emphasizes the powerful role of both static and performative elements of symbolic universes, arguing that the act of participating in these rituals both produces and affirms order.<sup>22</sup>

As both Rydell and Benedict illustrate, the hierarchical ordering of things, people, and ideas by nations hosting world's fairs during the late nineteenth and early twentieth centuries

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<sup>21</sup> Rydell, *All the World's a Fair*, 2.

<sup>22</sup> Benedict, *The Anthropology of World's Fairs*, 10.

was one of the central strategies for portraying control both domestically and throughout colonial territories. As highly orchestrated and holistically planned exhibitions, world's fairs provided an ideal vehicle for spatializing and ritualizing such strategies through display and performance, being staged for national and international audiences often numbering in the millions. Attendance figures demonstrate the enormous popularity and extensive public exposure of the era's larger international exhibitions, beginning with over six million visitors to London's Great Exhibition of 1851 and growing to 32 million visitors to the Paris Exhibition of 1889, and by the 1933 Chicago Century of Progress exposition attendance numbers had swelled to 49 million.<sup>23</sup>

David Nye, one of the more prominent scholars to pursue the social construction of experience and meaning within the study of electric lighting, has devoted much of his scholarship to such issues, arguing against strictly technological reading and contributing significantly to the development of social and cultural histories of electrification and electric light in the United States. Arguably the most significant contribution to the study of illumination strategies employed at American world's fairs and expositions to date, Nye's *Electrifying America* explores the political and social context of the display and promotion of electric illumination at American fairs.<sup>24</sup> Further insights can be found in the lesser-known article, "Republicanism and the Electrical Sublime," in which Nye extends the concepts introduced in *Electrifying America* offering a compelling argument for the role of the sublime in the reception and interpretation of electric lighting spectacles in the United States in this period. Calling attention to the role of America's world's fairs in parading electricity as cultural progress, Nye explains that the elaborate displays organized by the nation's electric

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<sup>23</sup> Findling and Pelle, *Historical Dictionary of World's Fairs and Expositions*.

<sup>24</sup> Nye, *Electrifying America*; and, David E. Nye, *American Technological Sublime* (Cambridge, Mass.: MIT Press, 1996).

industry “helped to impose a middle-class progressive order on the world, and...helped to give the visitor an explanatory blueprint of social experience.”<sup>25</sup>

Exploring this concept in some detail, Nye argues that during the later nineteenth century traditional American public rituals and celebrations of Republicanism were subsumed within the increasing rhetorical emphasis on technology. Opening up his investigation beyond the confines of world’s fairs and expositions, Nye traces the cultural development of public festivals in the United States, suggesting that such ceremonies were central in demonstrating models of public virtue and creating a sense of participation in civic society during the first century of the country’s nationhood. The best recognized of such celebrations was the Fourth of July, which Nye describes in Jeffersonian terms as initially inseparable from the Republican ideal of citizen virtue. He writes, “In Jefferson’s vision, rural life itself ensured the morality of the citizenry, and therefore ritual observances such as the Fourth of July did not so much inculcate virtue as give it an historical dimension.” The composition of the early American public ceremony was “oratory, bonfires, parades, brass bands, fireworks and gun salutes.” While European Christian traditions endowed the church with moral force, American society placed moral responsibility with the individual citizen, which provided the foundation for early Republicanism. By the end of the nineteenth century, the power to uplift and ennoble the citizenry in the United States was no longer the exclusive territory of the church—if it ever had been—but demonstrated instead through agnostic machines, fueled by the nation’s formable control of natural resources and technology.

Analyzing Leon Marx’s concept of the technological sublime, Nye argues for the relevance of this framework in understanding the social and political development of public ritual and spectacle in the United States during the later nineteenth and early to mid-twentieth

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<sup>25</sup> David Nye, “Republicanism and the Electrical Sublime,” *ATQ-19<sup>TH</sup> Century American Literature and Culture* 4.3 (1990): 185-201.

centuries.<sup>26</sup> He writes that the “awe induced by seeing an immense or dynamic technological object was celebrated as a recognition of the power of human reason,” and through this awakening, instead of communicating the raw power of nature or God, man was situated as creator, and in particular, this would confer “a special status to engineers and inventors.”<sup>27</sup> The technological sublime as embodied in the nineteenth-century dynamo or the spectacular display of electric illumination therefore provided another means of substantiating the cultural narratives presented at United States world’s fairs. As Nye describes, “Not only had nature ceased to be the source of sublime emotion, replaced by human creations, but the technician had displaced the scientist. Instead of searching for fundamental relations between man and nature, the inventor found ways to dominate and control nature.”<sup>28</sup>

However useful and insightful these studies, Nye leaves room for further scholarship in several key areas, which may be best summarized by the following queries: how did the use of spectacular electric illumination contribute to the perception of electrification as indivisible from cultural progress? In what ways did United States world’s fairs of the later nineteenth century and early twentieth century create an iconography of progress with the symbolic use of electric illumination? In what ways did General Electric, and Westinghouse to a lesser degree, influence or control the presentation of electricity and electric light at American world’s fairs and expositions? And finally, how did the emerging field of illuminating engineering contribute to the visual, physiological, and aesthetic experience of these fairs through the use of architectural and spectacular illumination?

This chapter will examine the role of electric light in articulating and sustaining ideological narratives at United States world’s fairs and expositions between 1893 and 1915, exploring the critical role of electricity and electric light in defining national identity and

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<sup>26</sup> See Leo Marx, *The Machine in the Garden* (New York: Oxford University Press, 1965), 195; also discussed in Nye, “Republicanism and the Electrical Sublime.”

<sup>27</sup> Nye, “Republicanism and the Electrical Sublime,” 187.

<sup>28</sup> *Ibid.*, 188.

expressing notions of America's cultural preeminence as a modern industrialized nation. While analysis of the role of electric light at United States world's fairs after World War I would provide further insights into the development of these themes, the formative period in the codification of the symbolic use of electric light in expressing national narratives and the development of lighting technologies and applications is most concentrated between the late nineteenth and the early twentieth centuries. It is beyond the scope of this chapter to address the whole of America's world's fairs, therefore focus is kept on the most important and influential expositions in the history of electric illumination during the period of the United States' most determined campaign to achieve recognition as a world-leading nation. Finally, this chapter will also explore the ways in which General Electric deftly coordinated and managed the representation of its products, inventors, and history at America's world's fairs and expositions, securing a prominent role for electric light and electricity at every major world's fair in the United States during this period. Calling attention to the deep involvement of General Electric and its engineers and researchers in America's most successful international expositions, the chapter will highlight their efforts to shape the rhetoric and symbolism of the nation's cultural progress as inextricably linked to the catholic consumption of electricity.

### **New York's Crystal Palace of 1853**

Edward Riddle, who had served as the United States Commissioner to London's Great Exhibition of 1851—the first large-scale international exposition—sensed the potential benefit of replicating the model it established on American soil, and took advantage of his extensive contacts to gather enough support to realize the nation's first international fair, the

Exhibition of the Industry of All Nations held in New York City in 1853.<sup>29</sup> However, Riddle's influence was not great enough to garner federal sponsorship, thus while international in scope it lacked the equivalent support and gravitas of a royal commission, such as backed London's Great Exhibition—which would become all too apparent when the fair fell on hard times. Inaugurated in July of 1853 by President Franklin Pierce, the New York "Crystal Palace" exhibition, so called for its similar glass housing, mimicked its predecessor in many ways. To differentiate the New York exhibition, fair planners called upon particular American strengths, namely industrial technologies and engineering, as suggested in the official stated aim to display "the choicest products of the Luxury of the Old World and the most Cunning Devices of the Ingenuity of the New."<sup>30</sup> Here rhetorical emphasis was given to staking claim to the scientific and technological achievements of the United States over and above the excellence of the nation's manufacturing, farming, or natural resources.

### **The Centennial International Exhibition of 1876**

Despite the initial ambition and optimism that accompanied its opening, the New York Crystal Palace ended very darkly, deep in bankruptcy—counting losses near \$340,000—with a final blow delivered by a ravaging fire that burned the site to the ground in 1858.<sup>31</sup>

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<sup>29</sup> There are many excellent sources on the Great Exhibition of 1851, including: Jeffery Auerbach, *The Great Exhibition of 1851: a nation on display* (Yale University Press, 1999); Hermione Hobhouse, ed., *The Crystal Palace and the Great Exhibition: Science, Art and Productive Industry: The History of the Royal Commission for the Exhibition of 1851* (A&C Black, 2002); Peter H. Hoffenberg, *An empire on display: English, Indian, and Australian Exhibitions from the Crystal Palace to the Great War* (University of California Press, 2001); Louise Purbrick, *The Great Exhibition of 1851: New Interdisciplinary Essays* (Manchester University Press, 2001); Jules Lubbock, *The Tyranny of Taste the Politics of Architecture and Design in Britain 1550-1960* (New Haven, CT.: Paul Mellon Centre for British Art, 1995); and Rydell, Findling, and Pelle, *Fair America*, 14-17.

<sup>30</sup> As quoted in Robert C. Post, "Reflections of American Science and Technology at the New York Crystal Palace Exhibition of 1853," *Journal of American Studies*, Vol. 17, No. 3 (Dec., 1983): 337-356; quote on page 338. Other sources on the 1853 fair include, Charles Hirschfeld, "America on Exhibition: The New York Crystal Palace," *American Quarterly* (1957): 101-116; Rem Koolhaas, *Delirious New York: a Retroactive Manifesto for Manhattan* (The Monacelli Press, LLC, 2014); Rydell, *Fair America*; and Rydell, Findling, and Pelle, *All the World's a Fair*.

<sup>31</sup> Hirschfeld, "America on Exhibition."



Following the disappointment of the New York exhibition, it would be almost a quarter century before the United States would host another world's fair, The Centennial International Exhibition of 1876, held in the city of Philadelphia. As typical with the origins of many world's fairs, the 1876 Centennial began with the belief that such an exhibition could achieve significant benefits and otherwise unobtainable objectives. In particular, organizers hoped that the fair could unify the nation, healing the deep social and political wounds left by the Civil War. Furthermore, it was believed that such a fair would establish a new economic outlook for the USA, freeing the nation from the lingering effects of the industrial depression of 1873.<sup>32</sup>

Continuing the theme of innovation and superior technological applications as highlighted at the New York exhibition of 1853, such assets again featured prominently in the symbolic and cultural ordering of the Centennial. Here, the great Corliss engine, located in the Machinery Hall was promoted as the “centerpiece” or “heart” of the exhibition. Its significance was marked by its central role in the opening ceremonies. George Corliss, commissioner from Rhode Island and inventor of the machine, joined in as President Grant and Emperor Dom Pedro of Brazil turned the wheels of the Corliss and started the generator that provided the power for the exhibits in the Machinery Hall of the Centennial Exhibition. Described as “an athlete of steel and iron,” the Corliss engine indeed was effective in eliciting aspects of the technological sublime for many who paused before it in reflection. The spirit of this experience was described by the Californian poet Joaquin Miller, who wrote of how each American's “heart thrills with pride and love of his land as he contemplates the vast exhibition of art and prowess here...Great as it seems today, it is but the acorn from

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<sup>32</sup> Rydell, *All the World's a Fair*, 10. Also on the Philadelphia fair of 1876 see Bruno Giberti, *Designing the Centennial: A History of the 1876 International Exhibition in Philadelphia* (University Press of Kentucky, 2015), and Linda P. Gross and Theresa R. Snyder, *Philadelphia's 1876 Centennial Exhibition* (Arcadia Publishing, 2005).

which shall grow the wide-spreading oak of a century's growth."<sup>33</sup> Such displays of American technological achievements held pride of place within the main halls of the fair. Further dramatizing their symbolic expression, these displays of technological prowess were often juxtaposed in their arrangement to cultural exhibits of foreign and indigenous people and products.<sup>34</sup> Such hierarchical spatial and symbolic strategies privileging innovative and productive uses of technology would become a defining feature in the exhibitionary staging of American world's fairs, and as such a constitutive element in the formation of United States national identity, as well as popular beliefs about race, gender, progress and technology.

The prowess as well as the artistry of American technology attributed to such exhibits as the Corliss engine could be more generally extrapolated to other commanding technological displays at any number of the nation's international fairs in the later nineteenth century. The role of artistry in the application and symbolic expression of American technological achievement became particularly dominant in the last quarter of the nineteenth century, as America's fair planners and political leaders set out to define the nation's global leadership through an evolutionary teleology wherein such technological advances signaled the highest achievements of Western society. Electricity and electric lighting were readily assimilated into this tradition, arguably becoming the most prominent symbolic expression of America's technological advancement by the early twentieth century. The pioneering illuminating engineers who developed and designed the architectural illumination and spectacular lighting effects for America's world's fairs and expositions described their work in aesthetic terms, arguing for the artistic value of their contributions. Similarly audiences who recorded their experiences of the electric illumination at American fairs frequently

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<sup>33</sup> Rydell, *All the World's a Fair*, 15-16.

<sup>34</sup> Rydell, Findling, and Pelle, *Fair America*, 23; and throughout Rydell, *All the World's a Fair*.

commented on the extraordinary artistry of the lighting effects.<sup>35</sup> Thus the architecture and spectacular illumination of United States world's fairs and expositions was much more than just bombastic or propagandistic displays of the nation's technological achievements and command of natural resources, being also important expressions of urban-scaled artistry and creativity. Between the late 1800s and early years of the twentieth century, such spectacular displays penetrated the darkness of night, sparking the interest and imagination of millions of fairgoers, and animating new forms of nocturnal architecture and aesthetic expression, emerging as Nye has suggested, as a "central cultural practice" in the USA<sup>36</sup> It was at world's fairs that many Americans first glimpsed the possibility of an electrified and electrically illuminated built environment.

### **The World's Columbian Exposition of 1893**

In 1893 the city of Chicago, with the assistance and supervision of a specially appointed national commission, hosted the World's Columbian Exposition to mark the four hundredth anniversary of Columbus's discovery of the New World.<sup>37</sup> Arguably the most elaborate and extensive international exposition produced in the United States during the nineteenth century, the World's Columbian is among the most renowned world's fairs of all time.<sup>38</sup> With total attendance numbering more than twenty million visitors and a profit of roughly \$1.4 million dollars, the World's Columbian Exposition was an unprecedented

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<sup>35</sup> Nye, *American Technological Sublime*, 143-152.

<sup>36</sup> Nye, *Electrifying America*, 30.

<sup>37</sup> Chicago's local committee, organized in 1889, was comprised of wealthy residents and leaders from the city's business community. The national committee was appointed by Congress in April 1890, in response to concerns about Chicago's ability to organize a "world-class" exposition. Findling and Pelle, *Historical Dictionary of World's Fairs and Expositions*; Rydell, Findling, and Pelle, *Fair America*, 30-31. In addition see, Norm Bolotin and Christine Laing, *The World's Columbian Exposition: The Chicago World's Fair of 1893* (University of Illinois Press, 1992); Robert Muccigrosso, *Celebrating the New World: Chicago's Columbian Exposition of 1893* (Ivan R Dee, 1993); Robert Rydell and Nancy E. Gwinn, eds., *Fair Representations: World's Fairs and the Modern World* (Amsterdam: VU University Press, 1994); and Marian Shaw, *World's Fair Notes: a Woman Journalist Views Chicago's 1893 Columbian Exposition* (Pogo Press, 1992).

<sup>38</sup> R. Reid Badger argues this point in his summary of the 1893 Chicago World's Fair in Findling and Pelle, *Historical Dictionary of World's Fairs and Expositions*, 124.

success for an American fair. It also was the most brightly illuminated international exhibition to that date, with more lighting in the electrical building alone than in the whole of the Paris exposition of 1889.<sup>39</sup>

On both a local and national level, this exposition was seen by its organizers as an opportunity to display and promote the expanding industrial power and cultural reach of the United States. From the outset, it was imagined as a material challenge to the established cultural dominance of British and European centers such as London, Paris and Vienna. On a national level there also was much interest in demonstrating that the country had recovered from the economic and social devastation of the Civil War and the pernicious financial effects following the Panic of 1873. For the city of Chicago, hosting an international exhibition would show the world that the city had been rebuilt from the ashes of the devastating fire of 1871. For Chicagoans as well as the federal government, the 1893 exposition offered a prime opportunity to illustrate to the American public and the world that the nation had fully recovered and was prepared to assume prominence as a major world power.<sup>40</sup>

With federal approval and support, the local Chicago Coalition brought in one of the most renowned landscape designers of the day, Frederick Law Olmsted to advise on site location and planning. Daniel H. Burnham and John W. Root, who together headed one of Chicago's most successful architectural firms, were appointed consulting architects for the exposition and were in charge of the selection of contributing architects. Burnham and Root, who did not design any buildings themselves, determined the monumental neoclassical style characterizing the fair's architecture. A remarkably simple but effective design strategy, Burnham and Root's architectural planning committee established a common cornice height to ensure visual unity across the grand neoclassical buildings surrounding the central Court of

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<sup>39</sup> Nye, *Electrifying America*, 37.

<sup>40</sup> Rydell, Findling, and Pelle, *Fair America*, 8-9.

Honor—a unity further emphasized by the whitewashing of the facades, which earned the fair the nickname the White City. The exposition’s planners and architects believed that such a prescribed aesthetic environment would generate civic pride and express cultural gravitas.<sup>41</sup>

Of equivalent professional stature to Olmsted and Burnham and Root, the illuminating engineer Luther Stieringer of the Edison Electric Lighting Company was commissioned to plan and design the lighting for the fair. Building upon the popular success of his lighting for the Louisville Southern States Exposition of 1883, Stieringer was a formative figure among those electrical engineers beginning to specialize in lighting, and in particular, exposition and urban illuminating engineering and planning. He was recognized also for his keen interest in developing methods of adapting electric lighting for artistic expression, what he described as “light painting.”<sup>42</sup>

With this formidable design team, organizers set out to demonstrate to the world that not only Chicago but also the United States could stage a world’s fair of unprecedented quality and harmonious design. As the Exposition’s official historian Hubert Howe Bancroft described,

Through the efforts of certain practical business men, subscribing and securing subscriptions for the necessary funds, a corps of architects was brought together, for the most part unknown to each other, and accustomed to plan and execute independently each in his own field, willing however to sink personal pride, unite for a common purpose, and accept one from the other mutual criticism and advice, so as to produce in this city of the Fair a unique and homogenous spectacle, one where every design bears upon it the handwriting of the artificer, and where every building is adapted to its special use.<sup>43</sup>

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<sup>41</sup> The World’s Columbian Exposition might never have become the “White City” if John Root had not died of pneumonia early in the planning stages of the fair. Root had indicated a desire for variety of colors to be used in the painting of the facades of the fair’s buildings. The eventual homogenous neoclassical landscape of the Chicago fair garnered some criticism, as from Louis Sullivan who believed the exposition architecture set the American architectural movement back fifty years. See Findling, *Chicago's Great World's Fairs*, and Rydell, Findling, and Pelle, *Fair America*, 32-33.

<sup>42</sup> Luther Stieringer, “Electrical Installation and Decorative Work in Connection with Exposition Buildings,” *Engineering Record* 44, 12 October 1901, 350.

<sup>43</sup> Hubert Howe Bancroft, *The Book of the Fair; an Historical and Descriptive Presentation* (Chicago: Bancroft Co., 1893), 64.

In the classification of the exposition's major departments, the National Commission similarly gave close attention to defining elements that would most clearly illustrate the superiority of the nation's industries and arts. Soliciting the support of George Browne Goode, assistant secretary of the Smithsonian Institute, the National Committee designated thirteen major departments: agriculture, horticulture, livestock, mines and metallurgy, fisheries, manufactures, machinery, transportation, electricity, fine arts, liberal arts, ethnology, and miscellaneous exhibits. These departments were organized to demonstrate the "progress of Mankind" and the achievements of "civilized life"—reinforcing the notion that the United States was a legitimate rival to any European nation.<sup>44</sup>

Reviewing the list of departments, electricity appears somewhat out of place with the others. A power source still relatively unfathomable by a large portion of the population, electricity was not a "living" product like those represented in the departments of horticulture, fisheries, and livestock. It was not an obvious cultural product such as those found in the departments of fine and liberal arts, and it was not a material product like those of the manufactures, machinery, and transportation departments. Yet even as a mysterious force, hard to display and to explain to the layperson, electricity remained one of the most highly promoted departments of the fair. The increasing prominence of electrical displays at world's fair in this period also served the objectives of the rapidly consolidating electric industry, which by 1892 was all but controlled by General Electric and Westinghouse. The National Electric Light Association (NELA)—a national trade association established in 1885 and comprised of members from across the United States electric industry—also took an active role in ensuring the most advantageous representation and promotion of electric light at United States fairs and expositions, including Chicago's exposition of 1893.<sup>45</sup>

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<sup>44</sup> Bancroft, *The Book of the Fair*, title page.

<sup>45</sup> Nye, *The American Technological Sublime*, 151.

With the collective force of the industry behind it, electricity was afforded a prominent role at the World's Columbian Exposition, as is evidenced in much of the contemporary discourse surrounding the exposition and its promotion. In Bancroft's official account of the exposition, *The Book of the Fair*, the department of electricity is introduced with a nationalizing agenda that clearly aims to carve a unique position for the United States in regards to this area of technological innovation:

Alluding to the huge manufacturing systems of Great Britain, her innumerable railroads and her ubiquitous marine, it was remarked by Emerson that steam is the half of an Englishman. If this be so, it may be said with equal truth that electricity is the half of an American, for while the earlier discoveries in electric science were made in other lands, no nation has displayed such aptness and ingenuity in adapting them to practical use. Here the patient and ill requited toil of Samuel Morse has fructified into a network of telegraph lines, which carry the tidings of the world with the swiftness of thought to every section of the republic; here was conceived the plan for the first of our submarine cables, and here was invented the telephone, by means of which many millions of spoken words are carried daily over the wires. And so with apparatus for lighting, motion, the transmission of power, and other purposes, our electric lamps and dynamos, our motors and cars being now exported to every quarter of the earth.<sup>46</sup>

The exposition's promotion of such American technological achievements, particularly in terms of the production and consumption of electricity, was intended for domestic audiences every bit as much as it was for foreign audiences. The general opinion among the nation's economists in the early 1890s was that the development of foreign markets for American goods was necessary to invigorate the United States economy and labor market as well as to counter the more radical economic scenarios being called for by Populist and Socialist reformers. They argued that if domestic stability was to be assured, the American public needed to believe in the future prosperity of the nation, and to see this eventual prosperity as the direct result of free-market production and export surplus.<sup>47</sup>

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<sup>46</sup> Bancroft, *The Book of the Fair*, 399.

<sup>47</sup> This point is made in *Fair America* in general terms of economic policy on the national level, but electricity is not mentioned specifically. See Rydell, Findling, and Pelle, *Fair America*, 39-41.

Given the opportunity to make this argument in a most spectacular and controlled way, exposition organizers put the nation's strengths on display, with electricity and its many applications at front and center. Stepping inside the Electricity Building's imposing neoclassical façade, fairgoers would have seen a landscape comprised of a variety of electrical engines, generators, telegraphs, light bulbs and assorted applications; here electricity was presented as a commodity of unfathomable measure. Bancroft's claim that electricity was not only a significant national resource, but also half of that which defined what it was to be an *American*, was bolstered by such a vast display. The subtext of this rhetoric however, was that to fail to support the development of America's electric industry was to fail the nation. This was very much a subject of popular debate in the years surrounding the exposition. Between 1890 and 1920 the United States was engaged in an intense dialogue concerning the place of electricity within American society, and in particular, whether there should be small independent generating stations or a centralized system, whether these should be public or privately held, how rates should be structured (to favor industry or the individual), and many other social and economic issues involved in the electrification of the nation. While the dramatic and spectacular displays of electricity and electric light at the Chicago exposition and others of this era were clearly aimed at impressing visitors—both international and domestic—it is important to understand the critical role of such displays in advancing the agenda of the electric industry in relation to these national debates.<sup>48</sup>

The matter of how to communicate the importance of electricity to a diverse public audience was solved in part by the choreography of the nighttime electric illumination. The nightly displays of dramatic electric lighting, combined with the “scientific” displays of technology in the Electricity Building connected this spectacle to the material progress of

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<sup>48</sup> Nye, *Electrifying America*, 138-85.



American industry. The conspicuous consumption of electricity required by these displays, as well as by the numerous searchlights, electric-driven gondolas, and other electrically powered displays at the fair, further illustrated the fecundity of the nation's resource. In the official iconography and ephemera of the exposition, electricity symbolized America's control over nature and its natural resources. In terms of its visual and material expression at the fair, the dramatic nighttime illumination of the exposition served as a commanding expression of American ingenuity and 'prowess'.

Chicago's Columbian Exposition was not the first world's fair to use electric light for symbolic or propagandistic expression however. The use of electric illumination at world's fairs, both internationally and domestically, was well established by 1893. A number of previous fairs had spectacular lighting displays that played a central role in promotion of industry and national culture; Paris in particular was associated with innovative uses of electric light at its international expositions in the final quarter of the nineteenth century. The International Paris Electrical Exposition for example, held in the summer of 1881 was used as a model by Thomas Edison for the promotion of his own electric lighting systems in subsequent international expositions held in America and abroad. Edison had sent a group of his best researchers to the Paris exposition to display some of his recent appliances and electrical systems, as well as to observe European exhibition techniques. Similarly at the Paris *Exposition Universelle* of 1889, extensive electric lighting was used for the transformation of the entire exposition after dark into a *ville lumière*. Electricity illuminated all 228 acres of the Paris exposition including the Eiffel Tower, which was painted with colored enamels, and illuminated with red, white, and blue lights at night.<sup>49</sup> While the

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<sup>49</sup> Later Stieringer was highly critical of the lighting executed at the Paris 1900 exhibition, summarizing its faults, "The Paris Exposition failed to profit by the experience of years, as exemplified at Omaha, and was a distinct step backward as far as illumination was concerned. No uniform scheme of illumination was there adopted. The lighting was...entitled to more credit as an exhibition of all known modern forms of lighting, than as a comprehensive scheme of exposition illumination." Luther Stieringer, "The Evolution of Exposition Lighting," *Western Electrician*, v. 29, no. 12 (Sept. 21, 1901): 187.

emphasis of much of symbolic and large scale illumination at the 1889 Parisian fair was in support of French objectives, the narrative was complicated by Edison's contribution to both the lamping of the exposition illumination (the Continental Edison Company provided 4,000 bulbs) and to the Palace of Mechanical Industries, where Edison's electrical inventions took up over an acre of display space.<sup>50</sup> The Edison exhibit included such propagandistic items as a copy of Robert Outcault's c.1880 painting of Menlo Park with a large Edison bulb overlying the landscape, radiating light "to all parts of the civilized globe...and the different countries lit by the Edison lamp."<sup>51</sup> The exhibit also included luminous American and French flags and a portrait bust of Thomas Edison, replete with an American eagle and "Edison, 1889" spelled out in electric Edison bulbs.

Setting out to 'one-up' such impressively illuminated international exhibitions, Chicago's World's Columbian organizers and planners invested in both quantity and quality. Surpassing all previous fairs in the total number of electric lights employed, the exposition boasted more electric lighting than any other single United States city at that time. Ninety thousand Westinghouse Sawyer-Mann incandescent lamps and five thousand General Electric arc lights were installed to illuminate the architecture and grounds of the World's Columbian Exposition. The magnitude of the exposition illumination could not have failed to awe fairgoers. Visitors to the Chicago fair could experience a greater amount electric light in one evening than they had previously seen in their entire lives.<sup>52</sup> The total combined illumination of the Paris Exposition of 1889 was still less than the amount of electric light used to decorate the Electricity Building alone at the World's Columbian. The nightly searchlight displays at the 1893 fair used three times the amount of electricity then employed

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<sup>50</sup> Shelley Wood Cordulack, "A Franco-American Battle of Beams: Electricity and the Selling of Modernity," *Journal of Design History* 18, no. 2 (2005): 147-166. See also Robert Fox, "Thomas Edison's Parisian Campaign: Incandescent Lighting and the Hidden Face of Technology Transfer," *Annals of Science* 53 (1996): 157-93.

<sup>51</sup> "The Edison Exhibit at the Paris Exposition," *Electrical World* 14, no. 20 (16 Nov. 1889): 323-25; also quoted in Cordulack, 156.

<sup>52</sup> Nye, *American Technological Sublime*, 146-50.

to light Chicago's streets.<sup>53</sup> These were astounding amounts of light. In 1890 there were only nine hundred thousand incandescent lamps and sixty-eight thousand arc lights in total in the United States, and only one percent of American homes had access to electric light.<sup>54</sup>

A number of recorded accounts suggest the popular appeal of the electrified nightly spectacle for visitors to the fair.<sup>55</sup> The engaging character of the illuminations is suggested in Bancroft's description of the dramatic staging of the light show:

Northward and to the west a heavy pall of smoke broods over the great midcontinent metropolis... Suddenly a beam of light shoots like a falling star from the lofty dome of the Administration building, and a moment later its symmetrical outlines stand out in tracery of fire. At its base is a circling wheel of light, and a hundred torches further relieve the black abyss beyond. Meanwhile a thousand lamps, clustered around the central avenue, have turned the night into day. Thus also the other great buildings that encircle the court assume their robes of light, with pillars, porticos, and colonnades blending in weird, yet brilliant perspective, like the threshold of an enchanted palace.<sup>56</sup>

Many of those who chronicled personal experiences of Chicago's exposition recounted the transformative effects of the electric illumination on the architecture and fairgrounds. The overwhelming monochrome whiteness of the fair architecture during the daytime was enlivened at night by swiftly changing green, blue, purple, yellow and scarlet searchlights mounted atop the Manufactures building. First picking out the dome of Richard M. Hunt's Administration building, the searchlights threw "into strong relief its delicate tracery of gold and white," and then swept across the Central Court, the Grand Basin, and Frederick MacMonnies' Columbian Fountain.<sup>57</sup> Viewing from the Lake Michigan Colonnade ('Peristyle') at the east end of the Grand Basin, visitors could take in the play of electric light across the Basin and the imposing facades of Central Court foregrounded by Daniel Chester

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<sup>53</sup> Jakle, *City Lights*.

<sup>54</sup> Nye, *American Technological Sublime*, 147.

<sup>55</sup> Quoted from caption text in Werner Company (Chicago), *The Columbian Gallery: A Portfolio of Photographs from the World's Fair: Including the Chief Palaces, Interiors, Statuary, Architectural and Scenic Groups, Characters, Typical Exhibits, and Marvels of the Midway Plaisance* (Chicago, Ill.: Werner, 1894).

<sup>56</sup> Bancroft, *The Book of the Fair*, 402.

<sup>57</sup> *Ibid.*, 401-2.

French's sixty-five foot Statue of the Republic, its golden surface glittering with the "piercing rays" of the search lights.

The dynamic spectacle began with white and gold beams that swept around the Grand Basin picking out the most important buildings and iconographic element, before moving to secondary elements and a brilliant array of animated colored light. The light show reached its climax at the head of the Grand Basin, as the fountains surrounding the MacMonnies' sculpture projected sprays, jets, and columns of illuminated water in varying hues, spreading iridescent rainbow reflections across the water. The sensorium created by the moving colored light, water, and reflections in combination with the nocturnal atmosphere of the fair was truly spectacular.<sup>58</sup> Perhaps because the scale, amount, and complexity of the electric illumination at the fair exceeded what anyone had witnessed before, it was a scene more understandable when couched in terms of the fantastic. Murat Halstead, a reporter for *Cosmopolitan*, described his awe before "the majestic sweep of the searching lights" that transformed the "earth and sky" as if "by the immeasurable wands of colossal magicians," and the glow of the Administration Building's dome that appeared "as if bound with wreaths of stars." Halstead credited not the gods however, but American technology, exclaiming, "It is electricity!"<sup>59</sup> This new source of power and light, Halstead claimed, made Chicago's exposition "more resplendent than the capitals of Europe." He concluded his report emphasizing the centrality of the production and consumption of electricity in the advancement of the nation, writing: "It is electricity that whirls the chariot wheels—the thunderbolts are harnessed at last."<sup>60</sup>

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<sup>58</sup> Ibid.

<sup>59</sup> Murat Halstead, "Electricity at the Fair," *Cosmopolitan* (1894): 578.

<sup>60</sup> Halstead.

### Architectural Outlining at the World's Columbian

The comprehensive lighting plan implemented at the World's Columbian Exposition was not the result of "colossal magicians" however, but rather was achieved through a close collaboration between Westinghouse and General Electric, local utilities, and fair organizers.<sup>61</sup> Not that the organizers had a choice; as briefly mentioned above, by the time of the Chicago world's fair the electric industry was essentially a duopoly, with General Electric holding seventy-five percent of the market and Westinghouse roughly fifteen-percent.<sup>62</sup> In addition to controlling the manufacture of the equipment needed to create large-scale electric lighting displays, General Electric and Westinghouse also held large blocks of stock in local utilities, thereby also controlling the supply and price of electricity.<sup>63</sup>

Besides supplying power and specialized lighting equipment, General Electric (more than Westinghouse in this respect) was largely responsible for the engineering and artistry necessary to compose elaborate electric lighting displays, calling upon its significant research facilities in Menlo Park and the company's growing cohort of illuminating engineers. Although illuminating engineering would not be professionally recognized until after the turn of the twentieth century, the discipline's history is intertwined with the development of electric lighting at the nation's world's fairs of the late nineteenth century.<sup>64</sup>

Under the leadership and direction of Edison's long-time collaborator, Luther Stieringer, the Chicago exposition garnered much praise for its innovative use of electric lighting, not surprisingly including the deployment of a number of Edison's new incandescent bulbs and arc lights. A further coup, the World's Columbian was also credited as the first American fair to use electric light to remain open to visitors after dark. The exhibition grounds, main building and art gallery were lit after dark using a combination of

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<sup>61</sup> Ibid.

<sup>62</sup> Jakle, *City Lights*, 71-72.

<sup>63</sup> Nye, *American Technological Sublime*, 150-51.

<sup>64</sup> See Chapter 4, "The Science and Art of Lighting," 206-230.

incandescent and arc lighting, controlled by rheostat to allow the illumination to gradually reach full power. The beauty of Stieringer's composition did not go unnoted, with some remarking that the slow, staged bringing up of the electric lights at sunset "from nothing to full candlepower" was a highlight of the fair.<sup>65</sup> This staged technique made possible with early rheostats became something of a signature of Stieringer's approach, one which he employed in 1883 for Louisville's Southern Exposition, in 1884 for the World's Industrial and Cotton Exposition in New Orleans, and again following Chicago, for the 1901 Pan-American Exposition in Buffalo. In the work of Stieringer's successors, this dramatic effect would become a part of the vocabulary of exposition lighting.

Consistently seeking to develop and refine the aesthetic effects of electric lighting, Stieringer dominated the field of exposition illumination until the close of the century, working as either Chief Electrical Engineer or Consulting Engineer at nearly every important American fair or exposition until his premature death in 1903. He had begun his career designing distribution systems for Edison's early electric lighting projects, and throughout his professional life Stieringer maintained a close association with him.<sup>66</sup>

Seeking to create electrically illuminated decorative effects as an extension of the exposition architecture for Chicago's 1893 exposition, Stieringer outlined and accentuated the cornices of the buildings and embankments of the Court of Honor with some 8,200 incandescent lights each of 10 candlepower. Previously Stieringer had used 16 candlepower incandescent bulbs for exposition outlining installations—including Louisville (1883), Philadelphia, St. Louis and New Orleans (1884)—but in Chicago he wanted to create a softer, more decorative effect and he successfully argued for lower candlepower bulbs to achieve the

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<sup>65</sup> Luther Stieringer, "The Evolution of Exposition Lighting," 187; and Bryan S. Bush, *Louisville's Southern Exposition, 1883-1887: The City of Progress* (Charleston, South Carolina: The History Press, 2011), 25, 45, 59.

<sup>66</sup> An interview with Edison that takes place on the grounds of the Buffalo 1901 expositions reveals the close mutual admiration of these two men. See "Edison at the Pan-American Exposition," *Western Electrician*, v. 29, no. 7 (17 Aug. 1901), 103. Stieringer's career and his influence on the field is highlighted in "Death of Luther Stieringer," *Electrical World and Engineering* 42, 4: 132; see also, Neumann and Champa, 231.

lighter luminous architectural tracery he desired. He also advocated for the burying of all electrical conductors, to “prevent interfering with the view in the main vistas.”<sup>67</sup> While this was a significant undertaking that came with an accompanying high price, it was so successful that it became standard practice for all subsequent expositions. In making the infrastructure of electric lighting as invisible as possible, Stieringer preserved the alchemy of his artistry.

Stieringer’s delicate light tracing the cornices and other notable architectural elements of the World’s Columbian’s most important buildings, provided a subdued backdrop for the illumination of the Grand Basin, which Bancroft described as a scene of brilliance “almost too dazzling for human eye to rest upon.”<sup>68</sup> And this may have been an understatement. The brightly lit fountains in the Grand Basin (each was equipped with lamps totaling 250,000 candlepower), the numerous searchlights, and the arc lights illuminating the walkways together produced over 11 million candlepower blazing in the White City each night. Arc lighting, which had been introduced as early as the 1840s, gained popularity after the 1860s when dynamos able to provide suitable sources of current were developed. A preferred light source for illuminating large open spaces, arc lighting’s strength was also its weakness—arc lights produced an intense, bright white light typically measuring candlepower in the thousands.<sup>69</sup> Rather than turning “night into day” as arc lights were believed to do, Stieringer sought to bring night to life with the measured use of multiple individual low brightness incandescent lamps able to produce light effects and compositions not possible under daylight conditions.<sup>70</sup> However, Stieringer’s outlining did not win everyone over, with some

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<sup>67</sup> Stieringer, “The Evolution of Exposition Lighting,” 187.

<sup>68</sup> Bancroft, *The Book of the Fair*, 402.

<sup>69</sup> Bernard S. Finn and Robert Friedel, *Lighting a Revolution: the Beginning of Electric Power* (The Smithsonian Institution: Washington DC, 1979), 9.

<sup>70</sup> While Coney Island’s parks appropriated much from Chicago’s World’s Columbian Exposition, no single “borrowed” element became more closely associated with Coney Island than the dramatic outline illumination of the amusement architecture. See Rem Koolhaas, *Delirious New York: A Retroactive Manifesto for Manhattan*, New ed. (New York: Monacelli Press, 1994); and Nye, *American Technological Sublime*, 152-53.

criticizing the two-dimensional character of his technique, which it was argued, over emphasized vertical structural elements and diminished viewers' spatial perception of the exposition architecture. These debates stretched far beyond the World's Columbian Exposition, and became a major point of contention within the emerging discipline of illuminating engineering.<sup>71</sup>

### **The Electricity Building**

While Stieringer's electric lighting scheme for the Chicago exposition was purposeful in its intention to awe visitors, fair planners were equally committed to reminding visitors that the luminous transformation of the fairgrounds at dusk each night was only made possible through the advanced science of electricity, which was on display inside the Electricity Building. With its own building, this was the first time an American world's fair had dedicated a major exposition hall solely to the electric industry and the promotion and display of its technological inventions and innovations. The relative position of the Department of Electricity within the fair's departmental hierarchy was demonstrated in the prominent location of the Electricity Building along the main axis of the exposition grounds. The Electricity Building sat across the North Canal from the massive Manufactures and Liberal Arts hall and faced the Court of Honor and the Administration Building. Designed by the Kansas City architectural firm Van Brunt and Howe, the Electricity Building harmonized with its neighbors, adhering to the regulation cornice height and presenting an imposing white neoclassical façade to the North Canal and the Main Court.

A soaring triumphal arch and pediment announced the main entrance of the Electricity Building facing the Court of Honor and the Grand Basin. Decorated with classical sculpture summarizing the pantheon of American innovation in the electrical sciences, the pediment

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<sup>71</sup> See Chapter 4, "The Science and Art of Lighting," 217-241.



glorified the electrical sciences and the role of the nation's inventors and inventions in its advancement. At the center of the pediment was a cartouche containing an image of an electromagnet—the chosen symbol of electricity. Two female figures flanked the cartouche, one representing electric light and the other the telegraph—the two principle electric industries at that time. Additionally the entrance was adorned with portrait medallions depicting Samuel F.B. Morse and Alfred Vail, the American inventors credited with the first successful transmission of an electric telegraph message. Finally, standing at the center of the entry court, under the decorated arch, was a fifteen-foot statue of Benjamin Franklin, portrayed gazing upward auspiciously at his kite, which was frozen in mid-air awaiting the strike of electricity that would complete the legend of Franklin's discovery.

Throughout the Electricity Building, a variety of displays reinforced the narrative suggested on the façade, casting the United States at the center of the historic taming of electricity. While Westinghouse had fought hard to win the contract to supply the power for the general illumination of the exposition, significantly underbidding General Electric, Edison and General Electric arguably retained the upper hand with a more desirable location and allocation of space within the Electricity Building. Westinghouse had focused their efforts on this contract, wanting to demonstrate the superiority of their alternating current (AC) system—which they did—but unfortunately Edison won the upper hand in terms of publicity. Also adding insult to injury perhaps, Westinghouse's massive power plant, capable of simultaneously powering nearly 200,000 lamps with a total capacity of more than 3,000,000 candle-power, which provided the electricity to light the exposition was installed in the Machinery Hall and only isolated demonstrations of the company's alternating current system could be found in Westinghouse's displays within the hall of Electricity.<sup>72</sup>

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<sup>72</sup> Christian Zaparka, "The Edison Effect: The History of Lighting in the American City," *Lotus International* 75 (1993): 60-77, and Nye, *Electrifying America*, 39-41, and Bancroft, 408-409.

While the vast contents of the exhibition hall portrayed a cumulative history of electricity, the thematic and narrative underpinnings of this collection connected American technology with teleological notions of progress. The Chief of the Department of Electricity described the didactic objective of the exhibition as “the enlightenment of the people as to the progress of a branch of science and industry yet scarcely out of its cradle, and to foreshadow the possibilities of its future.”<sup>73</sup> The General Electric exhibit dominated the center court of the building and was widely considered the most spectacular in the entire hall. The nearly encyclopedic display offered examples of “nearly all the uses to which electricity is put,” including machinery and apparatuses of “every description from the smallest of lamps to the most powerful of dynamos,” as well as electric toys, motors, motor cars, and 2,500 specimens of Edison’s incandescent lamps.<sup>74</sup> Anchoring the General Electric exhibit was the eighty-foot “tower of light,” an electrified tribute to Edison set atop a classical peristyle. The Edison Tower, as it came to be known, was covered with ten thousand miniature incandescent lamps mounted behind cut glass prisms and crowned by a “mammoth” incandescent lamp encased in a “crystal bulb.”<sup>75</sup> The General Electric exhibits surrounded the base of the Edison Tower with narrative displays depicting Edison’s development of the incandescent lamp along with a chronological survey of his early bulb and filament experiments. The nightly ritual of the lighting of the Edison Tower was a popular event that predictably evoked descriptions laden with the alchemic intermingling of magic and science. Bancroft recounted his impression of the lighting of the tower in the *Book of the Fair*: “At the silent touch of an unseen hand, the tower from base to apex is arrayed in robes of scintillating and many colored lights, we have here the very incarnation of electric science.”<sup>76</sup>

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<sup>73</sup> Bancroft, 405.

<sup>74</sup> An even more detailed description can be found in Bancroft, 406.

<sup>75</sup> John Patrick Barrett, *Electricity at the Columbian Exposition, Including an Account of the Exhibits in the Electricity Building, the Power Plant in Machinery Hall, the Arc and Incandescent Lighting of the Grounds and Buildings... Etc* (Chicago: R. R. Donnelley, 1894), 7-10.

<sup>76</sup> Bancroft, 425.

Also on display was Edison's first electric dynamo from Menlo Park, along with the Edison Electric Illuminating Company's Pearl Street Station dynamo, which provided power for the nation's first central station. Edison's ten-year-old "artifacts" supported the mythology of Edison's "pioneering discovery" of the electric incandescent light bulb and contributed to the notion of innovation as a distinctly American trait. It was a mythology however, and one greatly aided by its inclusion in the symbolic worlds created for and sustained by nineteenth and twentieth-century United States world's fairs and expositions. Edison's incandescent light bulb was predicated upon the successes and failures of many inventors and scientists before him and would not have been possible without these predecessors and their experiments. Most notably neglected in Edison's wake was Joseph Swan who had demonstrated his incandescent light bulb in Britain months prior to Edison's 'invention'.<sup>77</sup>

Viewed holistically, the use and display of electricity, both practical and symbolic at the Chicago's World Columbian Exposition—propelling electric launches, operating telegraphs, colorfully illuminating fountains, luminously outlining the buildings of the Grand Basin, lighting the boulevards of the fair—combined with the technical displays inside of the Electricity Building bound electrification closely to the image of the "dream city" and cast it within a larger narrative put forth at the fair of America's material and cultural progress. The nightly lightshows that animated the Grand Basin and the Court of Honor, retold the story of the fair each evening to amazed fairgoers, anointing the most prized elements of the exposition's architecture and iconography with powerful beams of light. In so doing, electricity and electric light held an important role in the performance and celebration of American ideals at Chicago's World's Columbian Exposition.

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<sup>77</sup> Robert D. Friedel, Paul Israel, and Bernard S. Finn, *Edison's Electric Light: Biography of an Invention* (New Brunswick, N.J.: Rutgers University Press, 1986).

### **The Pan-American Exposition of 1901**

The unprecedented popularity and financial success of Chicago's World Columbian Exposition spawned a series of imitators. Civic leaders across the United States sought to bring similar international attention and fiscal gain to their own municipalities. Heading into the close of the century, Chicago's fair was followed by the California Midwinter International Exposition of 1894 in San Francisco, Atlanta's Cotton States and International Exposition of 1895, Nashville's Tennessee Centennial and International Exposition 1897, and Omaha's Trans-Mississippi Exposition of 1898.<sup>78</sup> All of these fairs, to a greater or lesser degree offered variations on the symbolic wedding of American technology and invention with cultural progress. As Robert Rydell and others have demonstrated, the causal relationship linking scientific and technological advancement with cultural progress was commonly illustrated through the juxtaposition of ethnological exhibits of "primitive peoples" and elaborate displays of machinery, dynamos, electric motors, devices, lighting and equipment, and other technology driven elements of modern 'civilized' culture. While such strategies were commonplace at the major international expositions in Europe and the United States during the second half of the nineteenth century, the organizers behind the first American world's fair to be held in the new century, Buffalo's Pan-American Exposition of 1901, utilized such evolutionary strategies to situate electricity among the highest achievements of the New World. Helping to unify and animate the fair's overriding evolutionary narrative, the electric lighting at the Pan-American did much to sustain the exposition's aim to "illustrate progress during the century just closed and lay a strong and enduring foundation for international, commercial and social unity in the world."<sup>79</sup>

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<sup>78</sup> See Findling and Pelle, *Historical Dictionary of World's Fairs and Expositions*, 135-64.

<sup>79</sup> *Ins and Outs of Buffalo: Official Guide to the Pan-American City* (Buffalo: A.B. Floyd, 1901), 137, as quoted in Rydell, *All the World's a Fair*, chapter 5, note 3. See also, Findling and Pelle, *Historical Dictionary of World's Fairs and Expositions*, 165-171; and Jakle, *City Lights*, 156-57.

As early as 1896 the notion of hosting a world's fair in Buffalo had been suggested as a means of calling attention to the opening of the region's first hydroelectric plant at Niagara Falls.<sup>80</sup> The harnessing of the falls had endowed the region with an abundant supply of low-cost electricity, a resource that local civic and business leaders hoped to advertise with an international exposition. The theme of progress as realized through the electrical sciences therefore neatly dovetailed with Buffalo's vested interest in the promotion of hydroelectric power.

While the initial impulse for Buffalo's proposed exposition was to highlight the region's rich hydroelectric resources, the thematic objectives of the fair became broader and grander in scale as planning progressed. The United States' recent victory in the Spanish-American War had garnered the nation a place among the leading political and military powers of the world.<sup>81</sup> The defeat of the Spanish had also brought the United States colonial possession of the Philippine Islands, Guam, Puerto Rico, and a protectorate role over Cuba. It was with this sense of hemispheric confidence that Buffalo's Pan-American Exposition organizers announced the official aim of "promoting and conducting an exposition to illustrate the material progress of the New World."<sup>82</sup>

To oversee the planning and operations of the fair, the organizing committee appointed a seasoned exposition manager, William I. Buchanan as director-general of the Pan-American Exposition. Well suited to the role, Buchanan had held key positions at a number of regional and international expositions, including Chicago's 1893 fair, and of additional benefit, had established political connections in Latin America—an important factor given the stated aim of the exposition to strengthen relations across the region. In

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<sup>80</sup> On Niagara's generators and the development of Buffalo, see Jakle, *City Lights*, 156-57.

<sup>81</sup> Rydell, Findling, and Pelle, *Fair America*, 48-52.

<sup>82</sup> As quoted in Findling and Pelle, *Historical Dictionary of World's Fairs and Expositions*, 165. A valuable primary source that clearly illustrates the exposition's mission to present electricity as the greatest achievement of an advanced civilization see Hamilton Wright Mabie, "The Spirit of the New World as Interpreted by the Pan-American Exposition," *The Outlook* 68, 10 (6 July 1901): 529-47.

addition to Buchanan, other highly regarded consultants were brought in including Daniel Burnham and Frederick Law Olmsted, who assisted with site selection, Stieringer was given direction of electric lighting for the fair, Frederick W. Taylor was assigned exhibits and concessions, and supervision of exposition architecture was awarded to John M. Carrère based on his competition-winning plan for the fair, and who had an established architectural practice in New York City with Thomas Hastings. With heavy processional emphasis, Carrère's plan for the Pan-American fair tightly regulated the approach and entry to the exposition grounds, thereby creating greater control of visitors' "first impression" of the fair and the progression of fairgoers across its broad north-south axis and intersecting secondary axes. Upon crossing the Triumphal Bridge visitors would be delivered onto the main fairgrounds, entering the wide Esplanade, which was ringed by the first grouping of exhibition halls including the United States Government Buildings and those housing displays of the nation's national resources. This grouping underscored the connection between the successful conquest of nature and the Federal government's stewardship in managing and maximizing the nation's natural resources. Moving further into the fair, visitors would encounter the Fountain of Abundance, flanked by the Temple of Music and the Ethnology Building—a grouping which was intended to "mark a transitional point in the march from savagery to civilization."<sup>83</sup> Walking along the Court of Fountains, fairgoers would come to the final cross-axis. Here Carrère located the exhibition halls dedicated to technology and the "genius of man" including Electricity, Machinery and Transportation, Agriculture, and Manufactures and Liberal Arts. Anchoring the final grouping of exhibition buildings and terminating the vista of the main axis was the magisterial Electric Tower and Basin. The highly scripted, linear procession mandated by Carrère's plan suited the

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<sup>83</sup> Rydell, *All the World's a Fair*, 132.

evolutionary theme of the exposition, creating a remarkable stage set for illustrating the fair's "carefully crafted allegory of America's rise to the apex of civilization."<sup>84</sup>

### **Color, Light, and Evolutionary Theory at the Pan-American**

The sponsors and organizers for the Pan-American were acutely aware that a point of difference was needed to distinguish the Buffalo fair from its successful predecessors and to ensure that the exposition would draw large numbers of visitors. Deciding upon the use of color as a means of expressing a clear difference from Chicago's White City, organizers developed a plan to use a vibrant chromatic scale through which the buildings of the fair could visually play out the theme of America's evolution from New World to world nation. To develop and oversee the color scheme for the fair another World's Columbian alumna and president of the Art Students' League, the mural painter Charles Y. Turner, was appointed.

To illustrate mankind's evolution in Darwinian terms—particularly in reference to the popular binary of race and progress—Turner proposed a decorative color scheme for the fair that encoded a racial hierarchy in hues ranging from deep orange to violet to pale ivory. Visually expressing mankind's symbolic journey from 'primitive' to the highest achievements of the 'civilized' world, the coloring of the exposition buildings and decorative elements would advance from the most heavily saturated through to the lightest hue of ivory. Groups considered as representing "darker" or more primitive races, such as Cuba, the Indian Congress, the "African Village," the "Streets of Mexico," and the "Pre-historic Indian Grounds" were assigned to the darker colored outlying regions. Those groups selected as representing advanced civilizations or high cultural pursuits were colored in the palest hues.

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<sup>84</sup> Ibid., 130-132.

Reiterating the symbolic progression of the color scheme, 500 plaster sculptures were located along the main axis acting out the 'Path of Progress' in figurative allegory.<sup>85</sup>

### **The Electric Tower**

Signifying the pinnacle of this Darwinian-rainbow and presiding over the entire exposition was the nearly four hundred-foot-tall Electric Tower dressed in ivory and gold, with accents of emerald green. The pale green accent, which was used throughout the fair was chosen according to Turner, to "emphasize the great power which was being used to run the Exposition, the beautiful emerald-green hue of the water as it curls over the crest of Niagara Falls."<sup>86</sup> From the outset fair planners determined that it would "the most conspicuous and highest feature" of the exposition.<sup>87</sup> Based on Seville's La Giralda, Buffalo's Electric Tower symbolized man's dominion over Niagara Falls, which, as visitors were reminded frequently, provided electricity to the exposition. Graphically illustrating this relationship, a functioning, small-scale version of the mighty falls surged forward continuously from the tower's base. Crowning the tower was an eighteen-foot golden statue of the Goddess of Light, who stood with one arm raised towards the sky holding an image of the sun. Shortly prior to the official opening ceremonies, a reporter for the *New York Times* described the unavoidable presence of the Electric Tower at the Pan-American exposition, suggesting that the fair's planners and the Tower's architect had achieved or even exceeded the initial expectations for the exposition's defining structure:

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<sup>85</sup> Sasha Archibald, "Harnessing Niagara Falls," *Cabinet* 9 (Fall, 2005), accessed <http://www.cabinetmagazine.org/issues/19/archibald.php>

<sup>86</sup> Charles Y. Turner, "The Color Scheme," in David Gray, *Art Hand-Book Sculpture, Architecture, Painting: Official Handbook Of Architecture And Sculpture And Art Catalogue To The Pan-American Exposition* (Buffalo, N.Y.: David Gray, 1901), 20-21.

<sup>87</sup> John M. Carrère, "The Architectural Scheme," in David Gray, *Art Hand-Book Sculpture, Architecture, Painting: Official Handbook Of Architecture And Sculpture And Art Catalogue To The Pan-American Exposition* (Buffalo, N.Y.: David Gray, 1901), 16.



And now we come to the Electric Tower, which is the culmination and cynosure of the whole display, which draws the eye from all parts of the grounds and stops the vista of the main avenue. By the consent of all, it is fully worthy of its eminence and centrality. And one may confess that it is a refreshment to come upon something which is not "Pan-American," nor yet "Parisian," but just architectural...the tower as effectively dominates the Pan-American as the Eiffel did the *Champ de Mars* and Trocadero end of the Parisian show.<sup>88</sup>

The reporter's comments reinforced the nationalistic agenda of the iconographic program of the tower and of the fair itself. While the exposition's organizers had chosen the Spanish Baroque as the official architectural style of the fair in order to demonstrate allegiance with Latin America, in praising the avoidance of Pan-American or Parisian elements in the design of the Electric Tower, the reporter suggested instead its Americanness.<sup>89</sup> Furthermore, by emphasizing its architectural simplicity, the reporter underscored the notion of American technical superiority and modern sensibility. Finally, in likening the Electrical Tower to the Eiffel Tower, he positioned America's cultural achievements as equivalent (if not superior) to those of the French.

Although certainly impressive, it is hard to imagine that the Pan-American's tower could have rivaled the iconic Eiffel by day, by night however, the Electric Tower was an exceptional sight. Of the five hundred thousand incandescent bulbs used throughout the fairgrounds, thirty thousand alone were employed in the illumination of the tower. Additionally, ninety-four small searchlights were placed under and around the miniature falls at the base of the tower to suffuse the waters with a green glow reminiscent of the mighty Niagara. Finally, a massive searchlight was positioned atop the tower to sweep across the

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<sup>88</sup> M.S., "The Architectural Features of the Pan-American Exposition at Buffalo," *New York Times*, April 21, 1901.

<sup>89</sup> Rydell, Findling, and Pelle, *Fair America*, 48-52.

fairgrounds at night and to send signals to the Observation Tower at Niagara Falls, fifteen miles away.<sup>90</sup>

The Court of Fountains and the Grand Basin framed the brilliance of the Electric Tower with their own elaborate nocturnal illumination program. Sculpturally modeled electric lampposts accented the court's balustrades, architectural ornaments, and blossoming parterres with pools of soft light. Scattered throughout the court's central basin were specially designed floating lights, which were described in one contemporary account as appearing "like stars upon an inverted sky."<sup>91</sup> At the lower border of the Esplanade, the Triumphal Bridge was boldly illuminated and beyond the main court area were additional spectacular lighting arrangements, the most often remarked upon being the Electric Fountain, which was lit with twenty-two searchlights of changing hues.<sup>92</sup>

### **Stieringer's Luminous Sketch**

Developing a lighting scheme for the fair that would surpass its predecessors and establish a new standard for excellence in exposition lighting was essential, given Buffalo's economic interest in promoting electricity and its extensive hydroelectric resources. Furthermore, with the importance of the color scheme in the communication of the exposition's theme of evolution, the nighttime illumination of the fair grounds and buildings needed to be able to both articulate architectural features and preserve legibility of the many colored surfaces. Developing his illumination strategy for the Pan-American Exposition, Stieringer brought in Henry Rustin to assist with the project. The pair had successfully collaborated previously on the lighting of the Trans-Mississippi and International Exposition of 1898 in Omaha, Rustin serving as Stieringer's assistant. This experience was an important predecessor for their

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<sup>90</sup> The powerful searchlight atop the 360-ft level of the Electric Tower was manufactured especially by General Electric for the Pan-American Exposition under the specifications of Luther Stieringer. See Bennett, *The Pan-American Exposition and How to See It*, 10-11.

<sup>91</sup> *Ibid.*, 10.

<sup>92</sup> Neumann and Champa, 90.

efforts in Buffalo. Many of the lighting techniques that Stieringer and Rustin would successfully employ at Pan-American were first developed and tested for the Trans-Mississippi exposition. Unfortunately illness struck Stieringer in the spring of 1900 when fair planning and construction was most intense, and Rustin was assigned the role of Chief of Mechanical and Electrical Bureau, and oversaw the complex installation of the lighting for the exposition.<sup>93</sup>

Together Stieringer and Rustin devised a sophisticated and detailed lighting scheme for the fair that they claimed would exceed all earlier examples of exposition illumination and dramatically illustrate the superiority of American technology, engineering, and artistry in the electrical sciences. At the Pan-American Exposition, Stieringer debuted a more delicate and ornamental outlining technique than he employed in Chicago. This technique would become known in the illuminating engineering community as “the luminous sketch.” For the Buffalo exposition Stieringer’s proposed applying outlining to surface details and decorations as well as the architectural perimeter in a manner not unlike pointillism, a technique simultaneously being explored by painters in Europe and America.<sup>94</sup> Stieringer’s technique called for the use of many small points of light on the exterior of the major exposition buildings to create fine luminous decorative details. Furthermore, to reduce glare and to ensure a soft, warm effect, Stieringer specified 8-candlepower bulbs for the outlining instead of the 10-candlepower bulbs he had used in Chicago. Such a detailed and refined application of lamps had never been seen before at a major international exposition, and Stieringer and Rustin received much acclaim for the new technique.<sup>95</sup> However novel and innovative

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<sup>93</sup> Thomas Edison noted that it was illness that brought about Stieringer’s partial withdrawal from the project in an interview with a representative of the *Western Electrician*, published as: “Edison at the Pan-American Exposition,” *Western Electrician*, v. 29, no. 7 (17 Aug. 1901), 103.

<sup>94</sup> Nye, *Electrifying America*, 44.

<sup>95</sup> For secondary accounts of the fair see, Jakle, 156-57; Neumann and Champa; Nye, *American Technological Sublime*; and Nye, *Electrifying America*. Valuable primary sources include, Richard Hayes Barry, *The Grandeurs of the Exposition: Including State Buildings, Midway Scenes, Foreign Buildings, with Typical Buffalo and Niagara Falls Views* (Buffalo, N.Y.: R.A. Reid, 1901); Mark Bennett, *The Pan-American*

Stieringer's 'luminous sketch' appeared to audiences in 1901, it was a technique he had wanted to realize for some time but for which he had been unable to secure the support needed to execute such a scheme at a world's fair. He had first proposed such an approach to the organizers of Chicago's World's Columbian, but as Stieringer noted, "commercial rivalry and lack of support prevented" the execution of his plan. Fortunately, fair organizers for the 1898 Omaha exposition were more supportive of the extra investment necessary for Stieringer's new outlining technique and he was able to test out some of his ideas, which he would refine in his lighting plan for the Pan-American.<sup>96</sup> Acutely aware of the difficulties Stieringer had faced in his efforts to realize his plans as imagined, Edison himself commented, "He has been for years trying to do what he has at last done at the Pan-American, but the architects were all along doubtful of results, and he didn't have his way. But at last they partially agreed with him, and hence the lighting at the Pan-American." Edison laid blame not with the fair planners however, but with the architects, suggesting, "If the architects will only carry out Stieringer's suggestions, and do as he wants; not as they want, they will have the grandest exhibition of lighting the world has seen."<sup>97</sup> The struggle for artistic control between architects and the emerging field of lighting engineers, Edison keenly noted, would only become more highly contested as the twentieth century got underway—as will be discussed further in Chapter 4.<sup>98</sup> However for Stieringer and Edison, the illumination program realized at the Pan-American was clearly a victory for the lighting engineer.

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*Exposition and How to See It* (Buffalo, N.Y.: The Goff company, 1901); "Features at the Pan-American Show," *New York Times*, May 12, 1901; Mary Bronson Hartt, "How to See the Pan-American Exposition," *Everybody's Magazine* (October 1901): 488-91; Donald Murray, "The Automatic Age: Electrical Marvels and Mechanical Triumphs at the Pan-American Exposition," *Everybody's Magazine* (October 1901): 386-404; "Pan-American Exposition: Many Important Conventions to Be Held--Preparations for Elaborate Electric Light Effects," *New York Times*, January 6, 1901.

<sup>96</sup> Stieringer, "The Evolution of Exposition Lighting," 187.

<sup>97</sup> "Edison at the Pan-American Exposition," 103.

<sup>98</sup> See "The Science and Art of Lighting," 217-227 and 233-241.

### Electricity on Display

In addition to the exposition's nighttime illumination scheme, the fair also hosted a pavilion dedicated solely to the display of electrical technologies and industries. Situated directly opposite the Electric Tower on the terminating court of the main axis, Buffalo's Electricity Building held an even more prestigious position than its predecessor in Chicago. Within the Electricity Building, General Electric and Westinghouse both had prominent exhibit locations where they displayed their electric artifacts much as they had at Chicago in 1893, but this time Edison's historic dynamos were joined by newer electric technologies like the "modern telephone exchange," which utilized miniature incandescent bulbs to signal the telephone switchboard operator when a line was activated. Westinghouse suspended spectacular festoons of their new "Nernst" lamp across the ceiling of the building. The company was promoting these lamps with the hope that they would replace Edison's incandescent lamp in popularity and sales.<sup>99</sup> Other displays included a working-model of the Niagara Power House, General Electric's electrical equipment for the new Manhattan Elevated Railway, telegraph machines for transmitting messages and pictures, X-ray machines, electric engraving machines, and telephones. The latter, one of the most popular displays in the Electricity Building, included a table of "telephonic transmitters" that visitors could hold to their ears to "hear the thunderous roar of the Falls." The transmitters thus allowed the visitor to experience the *sound* of electricity as well.<sup>100</sup>

Even when stepping outside the Electricity Building, fairgoers would have found it impossible to avoid the display and promotion of the prized power source and its many applications. Across the exposition fairgrounds electricity was conspicuously promoted, as Mary Hartt described in *Everybody's Magazine*:

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<sup>99</sup> Zapatka, "The Edison Effect."

<sup>100</sup> Hartt, "How to See the Pan-American Exposition," 489.

This is an electric exposition; the electrical exhibits cannot be contained in a single building; they are everywhere. Niagara power drives the trolley which carries you to the grounds; turns the wheels of the countless machines in Machinery Hall; whirls the electric fans which cool the theatres in the Midway; illuminates the cycloramas and other electrical effects and illusions; makes possible the powerful search light on the Electric Tower which sends signals to Toronto; glows in the blended colors of the Electric Fountain; and blossoms in a whole firmament of electric stars which make up the glory of the Pan-American illumination.<sup>101</sup>

Such prose suggests the success of the Pan-American exposition in expressing the excitement and seemingly unlimited possibilities of electricity to popular audiences.<sup>102</sup> While the exposition's organizers and designers labored to comprise a harmonious and comprehensive expression of the fair's theme of the "triumph of civilized man in the New World," it would seem the illumination of the fair communicated most directly to visitors. As the *New York Times* observed, "To the visitor during these early days of the Pan-American Exposition it appears that the electric illuminations will form one the most prominent features of the big show."<sup>103</sup> What few predicted however was the tragic assassination of President William McKinley at the Pan-American on September 6<sup>th</sup> 1901 in the Temple of Music, which resulted in the early closing of the fair in November.<sup>104</sup> The closing of Buffalo's "show" was officially marked as President John G. Milburn "pressed an electric button and the lights in the Electric Tower grew dim for the last time."<sup>105</sup>

Unlike any other fair before or after it Buffalo's Pan-American Exposition placed electricity at its center. If the story of the fair was one of mankind's and America's evolution from 'primitive' to 'civilized' and if the narrative was developed through landscape, sculpture, architecture, ornament and color, and according to a formal plan picturesquely

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<sup>101</sup> Ibid.

<sup>102</sup> Findling and Pelle, *Historical Dictionary of World's Fairs and Expositions*, 165. See also Mabie, "The Spirit of the New World as Interpreted by the Pan-American Exposition"; and Murray, "The Automatic Age."

<sup>103</sup> "Features at the Pan-American Show."

<sup>104</sup> Eric Rauchway, *Murdering McKinley: The Making of Theodore Roosevelt's America* (New York: Hill and Wang, 2004).

<sup>105</sup> Quoted from "End of the Pan-American," *The New York Times*, November 2, 1901.

developed, then placing a Tower of Electricity at its apex was a very specific and unambiguous finale. The Tower itself further told the story of the region and of the taming of nature's wonders for production of power, the magnitude and magnificence of which was told through light. This light, beaming from the crown of the Tower, cascading down its surfaces in decorative patterns, and playfully changing color in its fountains, offered a mesmerizing embodiment of the great force of electricity. It suggested for visitors perhaps the momentousness of the era that would unfold. Most certainly for the organizers of the Buffalo exposition, it expressed the triumph of electricity and the economic promise of the region. While other fairs had used light with similar symbolic intentions, never before had the narrative been written so closely in tying the development of electricity to a national mythology of technology and progress—in this respect, Buffalo's 'City of Light' holds special distinction both in the history of American world's fairs and in the development of a symbolic language of spectacular illumination embodying nationalizing narratives.

### **The 1904 Louisiana Purchase Exposition**

Following closely on the heels of the Pan-American Exposition, was the St. Louis 1904 Louisiana Purchase Exposition—the last significant world's fair to be held in the United States until 1915. Organized to honor the one-hundredth anniversary of the purchase of the Louisiana territory from the French in 1804, the city's civic and business leaders had great ambitions to stimulate the local economy, draw international attention to the region, and educate visitors about the strengths and character of the American people and culture.<sup>106</sup> Borrowing a number of elements from previous large-scale United States expositions, St. Louis' strategy for differentiation, was primarily bigger and better. Hoping to leverage Buffalo's highly successful illumination program, fair organizers appointed Rustin head of

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<sup>106</sup> Findling and Pelle, *Historical Dictionary of World's Fairs and Expositions*, 180-185; Rydell, *All the World's a Fair*, 154-183; and Nye, *Electrifying America*, 34-35, 46-47.

the Electric Lighting Department. With Stieringer's premature death from Tuberculosis in 1903, Rustin had sole responsibility for the lighting of St. Louis exposition and not surprisingly, he proposed an outlining technique for the fair similar to that employed at the Pan-American. However by 1904 outlining had lost some of its novelty as it had been heavily exploited by popular American amusement centers such as Coney Island's Steeplechase (opened 1897) and Luna (opened 1903) parks.<sup>107</sup> Rustin's plan was not without novelty or innovation however, and particularly notable was his use of colored light, hidden architectural lighting, and rheostats that allowed a sweep of light sequentially changing from white to amethyst and then emerald to move across the park each night as the lights came up—a surprising and dramatic effect had never been realized on such scale at a world's fair before.

The concealed architectural lighting designed by Rustin for the St. Louis exposition represented a more significant shift in the nature of electric illumination at American world's fairs. Rustin achieved a number of original lighting effects by employing a silhouette technique, hiding bulbs behind columns, arches, and ornaments. Unfortunately, Rustin's heavy hand with the silhouette lighting, while stunning, obliterated the perception of architectural volume and form because of the glare produced by the large volume of incandescent bulbs. Stieringer's softer "luminous sketch" technique better preserved the architectural character of the buildings he illuminated and was perhaps more sophisticated than Rustin's lighting scheme. Yet the idea latent in Rustin's first attempt at concealed architectural lighting would be taken-up and developed by the next generation of illuminating engineers.<sup>108</sup>

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<sup>107</sup> For further discussion of the influence of electric outlining, first introduced at America's world's fairs and expositions on the development of theme park architecture and illumination see Zapatka, "The Edison Effect."

<sup>108</sup> Primary sources include, W.E. Goldborough, "Electricity at the St. Louis Exposition," *Electrical Age*, 32 (1904); *The Greatest of Expositions Completely Illustrated*; "Illumination at the St. Louis Exposition," *Electrical Age*, 32 (1904); and Robertus Love, "Illumination of the World's Fair," *Scientific American*, 90 (1904).



The Louisiana Purchase Exposition of 1904 marked the end of an era. It was the last major American world's fair to use outlining as its major decorative lighting scheme. The nighttime illumination displays at St. Louis, while not of groundbreaking character, still drew large crowds each night and enthusiastic responses in the press. A decade after St. Louis, the next significant American world's fair would introduce audiences from around the world to forms and expressions of electric light and architectural illumination, ushering in the first generation of self-proclaimed illuminating engineers.

### **The Panama-Pacific International Exposition of 1915**

A decade prior to the expected completion of the Panama Canal in 1914, discussions began on a national level about the possibility for an international exposition to celebrate the opening of the canal. San Francisco's business community, which had been wanting to stage a world's fair since 1904, lobbied in earnest to win official designation as the host city for the proposed Panama exposition, and the great earthquake and subsequent fire of 1906 that destroyed approximately four square miles of San Francisco, only fueled local interest and enthusiasm to hold a world's fair. Competing against San Diego, Los Angeles, New Orleans, San Francisco finally secured the right to host the national exposition using the proven strategy of underbidding competitors, accepting the nomination without any federal funding. The directors of the exposition came from many areas of the private sector—the president of the fair, Charles C. Moore, who had played a key role in representing the delegation from San Francisco in bidding before congress, was the founder of one of the nation's largest hydroelectric engineering firms and president of the city's Chamber of Commerce, while other members were bankers, publishers, department store owners, shipping magnates, and

executives of utilities and railroads.<sup>109</sup> Successful local entrepreneurs, the directors of San Francisco's exposition sought to ensure the success and profitability of the fair through the introduction of new, and even sensational, aesthetic choices, and moreover, to demonstrate to the world that the city had not only been fully rebuilt, but that it was grander than ever and should rightfully be seen as America's cultural and economic portal between the West and the East.<sup>110</sup> As stated in the Southern Pacific Company's handbook to the fair,

It is fitting that the Exposition, which marks the beginning of a new era in commerce, should be held on the shores of the Pacific. California marks the limit of the geographical progress of civilization. For unnumbered centuries the course of the empire has been steadily to the west. On the shores of the Pacific it finds itself still facing west yet looking to the east... This Exposition therefore marks the beginning of a new era in civilization. The circle is now fully circled; the West has met the East.<sup>111</sup>

### **The Lesson of Art**

As with previous fairs, the Panama-Pacific was thematically organized to demonstrate the nation's progress according to a hierarchical evolutionary logic, which placed white male Americans and the products of their labors at the pinnacle of civilization. Given California's, and in particular San Francisco's reputation at the time as something less than civilized—the city was better known at the turn of the century for its “lax enforcement of regulations on prostitution, alcohol consumption, and gambling” and frontier town mentality—fair organizers were keen to dispel such associations and portray San Francisco as not only a cultural and economic hub, but as a center for production and appreciation of the arts equal to

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<sup>109</sup> Moore was joined by other prominent businessmen and civic leaders from California in the delegation that traveled to Washington D.C. to present before Congress on Jan. 31, 1911, including R. B. Hale, M. H. deYoung, James McNab, W.C. Ralston, William Crocker, William R. Hearst, Julius Kahn, and Governor Gillette. United States, Congress, Senate, S. J. Res. 43 Joint Resolution for the appointment of a commission to be known as the Panama-Pacific International Exposition Commission, July 28, 1911. Washington: Govt. 1911. See also, Sarah J. Moore, *Empire on Display: San Francisco's Panama-Pacific International Exposition of 1915*, (University of Oklahoma Press, 2013), 180-182.

<sup>110</sup> Alexandra Stern, *Eugenic Nation: Faults and Frontiers of Better Breeding in Modern America* (University of California Press, 2000); and Findling and Pelle, *Historical Dictionary of World's Fairs and Expositions*, 219-20.

<sup>111</sup> *Panama-Pacific International Exposition, San Francisco, 1915* (San Francisco; Southern Pacific Company, 1915).

any found on the East Coast or Europe.<sup>112</sup> Whereas Buffalo placed electricity at the apex of its evolutionary tale of human progress, San Francisco gave art and aesthetic appreciation pride of place, putting far greater emphasis on the arts than previous expositions. They proposed building a city characterized by its overriding aesthetic refinement, and which encapsulated all the elements necessary to support modern ‘civilized’ culture, producing “a microcosm so nearly complete that if all the world were destroyed except the 635 acres of land within the Exposition gates, the material basis of the life of today could have been reproduced from the exemplifications of the arts, inventions and industries there exhibited.”<sup>113</sup> Similarly, Eugen Neuhaus, chairman of the Advisory Committee of the Department of Art for the exposition, noted:

It is generally conceded that the essential lesson of the Exposition is the lesson of art. However strongly the industrial element may have asserted itself in the many interesting exhibits, no matter how extensive the appeal of the applied sciences may be, the final and lasting effect will be found in the great and enduring lesson of beauty which the Exposition so unforgettably teaches.

Also dispelling misconceptions about California as a cultural backwater, he wrote,

There is still much of the popular conception abroad that the West has only very recently emerged from a state of semi-civilization inimical to the finer things of life, and to art in particular. But we may rest assured that the fortunate outsider who allows himself the luxury of travel will proclaim that the gospel of beauty has been preached most eloquently through the Panama-Pacific International Exposition.<sup>114</sup>

Aesthetic considerations therefore ranked highly in the composition of the design team for the Panama-Pacific. For the first time in the history of United States world’s fairs, organizers appointed both a Chief of Color and a Chief of Illumination to ensure that the whole of the

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<sup>112</sup> Stern, *Eugenic Nation*, 36.

<sup>113</sup> Frank Morton Todd, *The Story of the Exposition: Being the Official History of the International Celebration held at San Francisco in 1915 to Commemorate the Discovery of the Pacific Ocean and the Construction of the Panama Canal*, 5 vols. (New York: G.P. Putnam’s Sons/The Knickerbocker Press, 1921), xv–xvi.

<sup>114</sup> Eugen Neuhaus, *The Art of the Exposition: Personal Impressions of the Architecture, Sculpture, Mural Decorations, Color Scheme & Other Aesthetic Aspects of the Panama-Pacific International Exposition* (P. Elder, 1915); accessed <http://www.searchengine.org.uk/pdfs/4/775.pdf>

exposition was harmonic and aesthetically unified, and most of all that it left an indelible impression of beauty with visitors from across the nation and around the world.<sup>115</sup>

Breaking with the tradition of expansive, park-like fairgrounds, the organizers of the Panama-Pacific settled on a compact and efficient plan for the grounds. The main exhibition buildings, of approximately equivalent size, were organized according to a grid-like plan, symmetrically arranged around three courts, the largest and central being the Court of the Universe, with the slightly smaller Court of Ages (which would later be known as the Court of Abundance) on the east, and the Court of the Four Seasons on the west. The exposition palaces that anchored each court were designed and arranged so that the walls of the buildings would also form the enclosures for the courtyards. This architectural strategy served aesthetically to focus the courts and pragmatically to protect fairgoers from the sharp winds of the Pacific. Adding to the overall eclecticism of the fair—which blended elements of Oriental, Moorish, Greek, and Spanish Revival architecture—each major courtyard was designed by a different architect. The Court of the Universe was designed by the New York City firm McKim, Mead and White, the Court of Ages designed by San Francisco-based architect Louis Christian Mullgardt, and the Court of the Four Seasons, designed by Henry Bacon, an East Coast architect and alumni of McKim, Mead and White. Without question, the most admired of all the exposition's palaces however was the Fine Arts Palace, designed by another San Francisco based architect, Bernard Maybeck, which provided the western termination point of the main axes bisecting the courts. Terminating the eastern end of the axes was the massive Palace of Machinery, the largest single building at the fair.

In August of 1912, the Architectural Commission for the San Francisco exposition gathered to settle on number of priorities for the design of the buildings and the fairgrounds as a whole. Collectively they determined that rather than being “festive and frivolous, as for a

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<sup>115</sup> Gray Brechin, "Sailing to Byzantium: the Architecture of the Fair," in Benedict, *The Anthropology of World's Fairs*, 97–103.

transient amusement,” that the design of the exposition should be “serious and fine,” and that every aspect of the fair should be artistically sound and exemplary “works of beauty and power, of depth and dignity, and not of mere superficial appeal.”<sup>116</sup> To achieve such a lofty ambition, the Architectural Commission also included Jules Guérin, Chief of Color, and Walter D’Arcy Ryan, Chief of Illumination in the planning process.

Guérin, a well-known American architectural illustrator and watercolorist, was given unprecedented authorship and authority over the use of color throughout the exposition. Building upon his successful contributions to a number of previous international expositions including the Pan-American and Louisiana Purchase, Guérin took on his largest role to date at the Panama-Pacific, coordinating the entire color scheme for the exposition—including the many domes of the exhibition palaces, portals, tile roofs, columns, capitals, bases, moldings, friezes, architectural ornament, statuary, flag poles, and even garbage cans.

Taking inspiration from the California landscape, Guérin selected pastel shades of green, blue, pink, lemon and ochre for the building exteriors, specifying courtyard foliage complimentary to the coloring scheme of each building. Guérin approached the whole of the color coordination as a single composition, as he described, “In coloring a vast city of this kind, I treated it as I would a canvas for a picture. The first tonal value was the travertine, and on this travertine the other colors were applied; always having in mind the strong light of California, and keeping colors well toned down and mellow.”<sup>117</sup> Equally ambitious was his own agenda to convince the nation of the importance of color in architecture and urban planning, and Guérin argued optimistically, “I expect the influence of my work in San Francisco to be widely felt by designers of architecture in the future, as this Exposition shows that another element, color, can be used to great advantage in modern buildings.”<sup>118</sup>

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<sup>116</sup> Todd, *The Story of the Exposition*, 303.

<sup>117</sup> *Ibid.*, 348.

<sup>118</sup> *Ibid.*, 349.

### **Walter D’Arcy Ryan, Chief of Illumination**

Born in Nova Scotia, Walter D’Arcy Ryan moved to the United States in 1892 as an engineering apprentice at the Thomson-Houston Electric Company, the same year that the company was acquired by General Electric. After seven years there as an electrical engineer, Ryan decided to specialize in illumination, believing that it was a field that could be greatly improved through engineering and laboratory research. With \$10,000 seed funding from General Electric, Ryan established the company’s first Illuminating Engineering Laboratory in January of 1899, and in 1903 he was appointed the company’s first Illuminating Engineer.<sup>119</sup>

As director of the General Electric Illuminating Engineering Laboratory, Ryan had established a reputation for large-scale spectacular lighting displays with such widely publicized successes as the colorful and dramatic illumination of Niagara Falls in 1907 and his extensive lighting program for New York City’s Hudson-Fulton celebration in 1909.<sup>120</sup> With the illumination of Niagara Falls and the Hudson-Fulton Celebration, Ryan explored a number of spectacular lighting techniques that he would continue to develop throughout his career and for which he would become well known. Most prominent among these was his creation of the “Scintillator,” a sky-spanning lighting display that involved the use of colored filters, steam engines, and a nearly fifty moving searchlights in the creation of aurora borealis-like effects.

The popular success of Ryan’s early large-scale installations surely contributed to the Architectural Commission’s decision at the August 1912 meeting to solicit a lighting

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<sup>119</sup> John Winthrop Hammond, “A Tribute to Walter D’Arcy Ryan,” *General Electric Review* 37, 4 (April 1934): 321-22.

<sup>120</sup> Ryan’s work remains to be critically examined and indeed, is worthy of further research. Primary sources of note include, Orrin E. Dunlap, “Illuminating Niagara Falls with its own Power,” *Scientific American* 97 (19 October 1907); “Hudson-Fulton Illumination,” *Electrical Age* 40 (July 1909): 185; and “Hudson-Fulton Celebration,” *Electrical Age* 40 (Oct. 1909): 275. Secondary sources include Nye, *Electrifying America*, 57-70; Jakle, *City Lights*, 129-131; 160-163; and Neumann and Champa, 230.

proposal for the Panama-Pacific from the young illuminating engineer. Three months later Ryan presented his scheme to the commission. It was immediately accepted and he was named “Chief of Illumination” giving Ryan artistic control over the whole of the exposition lighting.<sup>121</sup> With the support of G.L. Bayley, Chief of the Electrical and Mechanical Engineering Department at the San Francisco fair, the Architectural Commission tasked Ryan with the creation of “a new form of exposition lighting,” which would clearly distinguish the Panama-Pacific Exposition from all others in the history of American expositions.<sup>122</sup>

Wanting to do things differently, not just bigger and brighter, San Francisco’s fair organizers were determined to have the exposition remembered for its beauty and artistic integrity, as demonstrated through architecture, sculpture, landscape, color scheme and electric illumination—with all elements working together in a unified aesthetic program. Therefore, Ryan’s lighting scheme held a key position in the conceptual, as well as the material planning of the San Francisco exposition. As Ryan described, this was to be the first international exhibition in the history of the United States to have the illumination “completely designed and charted before the buildings were erected.”<sup>123</sup> This notion of architectural integrated electric lighting, rather than applied post-design, was a key issue for illuminating engineers, who had pushed up against this matter since the 1890s. The tug-of-war with the architectural community about when and how electric lighting should enter the design process would continue throughout the twentieth century, but Ryan’s efforts at the Panama-Pacific demonstrate an early and impressive achievement for the integration of electric lighting and architecture. The lighting plan for the fair went well beyond specific instances of architectural or spectacular lighting and holistically considered general and

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<sup>121</sup> Anderson, J.M., "Lighting the Pan-Pacific Exposition: Origins of Illuminating Engineering," *Power Engineering Review*, IEEE, vol.18, no.2 (Feb, 1998): 24-25.

<sup>122</sup> W. D’Arcy Ryan, “Illumination of the Panama-Pacific International Exposition,” *General Electric Review* 18 (June 1915): 579-584, and W. D’Arcy Ryan, “Illumination of the Panama-Pacific International Exposition,” *Transactions of the Illuminating Engineering Society*, v.11, August 30, 1916, 631.

<sup>123</sup> Ryan, *Transactions*, 630-31.

utilitarian lighting, the design of lighting standards, fixtures and heraldic banners, the use of surface textures on the exhibition building to modulate lighting effects, as well as “specifications covering the glassware to be used with the various lighting units,” and the glazing of buildings. Such widespread coordination in the early planning stages between “chiefs of all departments, architects, designers, sculptors, modelers, horticulturists, and many others” to achieve the best lighting effects was unprecedented in American fair planning, indicating some awareness of the potential of illuminating engineering when treated as an integral aspect of exposition design.<sup>124</sup> Certainly this kind of holistic lighting plan was what Stieringer had sought to achieve in his lifetime, but which, sadly he could not realize. As he reflected a few years prior to his death,

The engineer who designs the illumination of an exposition has by no means an easy task. It is not simply a question of circuits...nor is it a question of placing a light here and there for immediate use. The expert on illumination must be able to see in the mind's eye the effect he will produce when the exposition is at a stage when the grounds are barren and the architectural features are but little further advanced than in sketches.<sup>125</sup>

Fortunately, Ryan was able to secure the high-level support necessary to produce a systematic and coordinated lighting plan much as Stieringer had imagined fifteen years earlier. With a surprising matter-of-factness, considering the historical uniqueness of his post as Chief of Illumination, Ryan described his entry to the project, writing:

In lighting propositions involving special effects or treatment, it has become the practice to employ an illuminating engineer in addition to the electrical engineer. It was therefore natural that when the Panama-Pacific International Exposition decided that its illumination should possess features of novelty to correspond with its general policy it recognized the necessity of establishing a department of illuminating engineering in addition to the electrical and mechanical department.<sup>126</sup>

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<sup>124</sup> Ibid., 631.

<sup>125</sup> Stieringer, “The Evolution of Exposition Lighting.”

<sup>126</sup> Ryan, *General Electric Review*, 579.



General Electric generously supported Ryan's appointment, providing significant financial and material resources, including sponsoring the establishment of a branch of the company's Illuminating Engineering Laboratory on the exposition construction grounds and staffing it with a full design team including the up-and-coming illuminating engineer A.F. Dickerson, to work as Ryan's assistant, decorative designer J. W. Gosling, draftsman J. W. Schaffer, photographer H.E. Mahan, and illuminating engineers F.A. Benford and E. J. Edwards.<sup>127</sup> The onsite laboratory and research team allowed Ryan to test and develop new lighting techniques specifically suited to the site, architectural program, and color scheme of the fair. With the authority his role afforded, in combination with the exceptional support and resourcing from fair organizers and General Electric, Ryan was well positioned to implement an innovative electric illumination scheme for the Panama-Pacific.

Beginning work in early 1913, Ryan and his team set about designing a lighting scheme that would complement the architectural style of the exposition, harmonize with the color palette set out by Guérin, and contribute to the overall aesthetic experience of the fair. Describing an approach that utilized solid engineering and research to advance artistic expression, Ryan suggested, "Like many other features of the Exposition, the illumination is highly educational in character and emphasizes more than anything that has gone before the result of concentrated study in the best uses and applications of artificial light."<sup>128</sup>

Determined to avoid a rehash of established exposition illumination techniques, Ryan proposed a radically new system of electric illumination for the fair. In particular he was critical of the continued use of electric outlining, commenting that in the illumination design of previous expositions "buildings have, in the main, been used as a background on which to display lamps." Respectful of the strides Stieringer and Rustin had made in their time, Ryan

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<sup>127</sup> Ryan, *Transactions of the Illuminating Engineering Society*, 631; Dickerson continued in the field, designing the lighting for the 1922 Brazilian Centennial and the 1933 Century of Progress in Chicago, and returning to San Francisco in 1939 to serve as Chief of Illumination at the Golden Gate International Exposition. See "Night Lighting...How It's Done," *Official Guide Book* (San Francisco: The Crocker Company, 1939).

<sup>128</sup> Ryan, *The General Electric Review*, 580; and Hall, "The General Electric Company's Exhibits," 561-63.

acknowledged that “the effects obtained at the Pan-American Exposition at Buffalo, could probably not be surpassed,” and as he noted, outlining as a method of architectural illumination had long since been over-popularized in amusement parks. More concerning for Ryan however was the way in which it suppressed the architecture, making it “practically impossible to obtain a variety of effects,” and ultimately resulting in a bland uniformity wherein “the Exposition from every point of view presents more or less similarly.” Equally problematic, Ryan called attention to the negative physiological effects of outline illumination, warning of the intense “glare from so many exposed sources particularly when assembled on light colored buildings” and the resulting eyestrain produced by viewing buildings lit in this manner.<sup>129</sup>

### **Luminous Surfaces and Shadows**

Discarding the approach made so popular by Stieringer and Rustin, Ryan developed an illumination scheme featuring soft indirect lighting and “illuminated” shadows that both preserved and enhanced the architectural solidity of the exposition buildings and courts after dark, as well as Guérin’s elaborate color program.<sup>130</sup> Employing more than five hundred projectors and three hundred and seventy searchlights, Ryan accentuated the textural treatment of the architectural surfaces and enhanced the color of the buildings at night—structural and decorative properties that otherwise would have been engulfed in darkness obliterated by brilliant arc lighting, or diffused by incandescent outlining. Ryan’s prescient use of indirect lighting was highly commended, and indeed, the transition from applied to integrated light, or more specifically from applied points of light to the architectural and atmospheric effects of light was a key innovation in the development of a modern

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<sup>129</sup> Ryan, *The General Electric Review*, 580. This was a major focus for the newly organized Illuminating Engineering Society, see Chapter 4 “The Science and Art of Lighting,” 206-216.

<sup>130</sup> Eugen Neuhaus, *The Art of the Exposition*, not paginated.

architectural aesthetic in the USA—as discussed further in Chapter 2.<sup>131</sup> In Ryan’s approach, architectural solidity and electric lighting were no longer at odds, but were instead complementary. After dark architectural forms and surfaces became media for light rather than serving as two-dimensional frames for luminous sketching. The official historian of the fair, Frank Morton Todd noted the significance of Ryan’s lighting scheme, not just in terms of the presentation of the Panama-Pacific, but moreover within the history of the art of the built environment, writing:

It was a world of art, colored with every harmonious tint that light can be made to convey; a world of art that no one had ever imagined before... The lighting of the Exposition marked an innovation and emphasized an epoch. The art had advanced. Indirect illumination played an important part... masked lamps flooded the walls and ornament and color ground-work of the palaces so that the architecture was as distinct by night as by day, and even more beautiful, for it possessed the added enchantment of ghostly light and shadow, with high relief and deep intaglio wherever breaks in the surface occurred. Not only surface texture, but color was revealed, for the light you saw was, in most cases, reflected from the buildings themselves.<sup>132</sup>

Others writing on the fair also singled out Ryan’s electric illumination scheme as one of the most significant contributions to the design and experience of the exposition. Ben Macomber likened the illumination of previous fairs to “the work of electricians,” whereas he argued that at the Panama-Pacific it was “artists who have created a great picture of light and color.”<sup>133</sup> Macomber’s downgrading of electricians, while certainly intended as a compliment for Ryan, was characteristic of the driving ethos of the fair, which placed artistic endeavors above those of science—a shift which one might argue signaled the nation’s growing confidence, especially in terms of challenging the more established European centers with America’s cultural and artistic production.

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<sup>131</sup> See Chapter 2, “Invisible Mechanisms of Modernism,” 86-91.

<sup>132</sup> Todd, *The Story of the Exposition*, 342. Similar comments can be found in other primary accounts of the exposition, garnering broad comment and praise.

<sup>133</sup> Ben Macomber, *The Jewel City: Its Planning and Achievement; Its Architecture, Sculpture, Symbolism, and Music; Its Gardens, Palaces, and Exhibits* (San Francisco: John H. Williams, 1915), 134.

Ryan's lighting scheme however, was as much science as it was art. Ryan's plan to light the exposition with indirect illumination certainly would not have been achievable without the support of G.E. research's team and the onsite laboratory.<sup>134</sup> The powerful arc lamps used for the general lighting of the courts, colonnades, and palaces, were shielded to keep the light only where desired, and further camouflaged from visitors' eyes in tall Venetian masts. Searchlights and projectors were also positioned out of sight atop exposition buildings and employed to light specific architectural features and important buildings. To relieve the intense contrast between the illuminated architectural surfaces and the black shadows produced by the direction of the floodlighting, Ryan used concealed incandescent bulbs "dipped in an orange tint" to provide ancillary projected light that appeared as warm, luminous shadows. Together the wash of light on the facades of the buildings and the colored shadows produced an effect of greater depth and three-dimensionality than had been seen previously.

Attentive to the overall continuity of his lighting plan with the other guiding aesthetic characteristic of the fair, Ryan worked closely with Guérin to create luminous color and special effects that would not only harmonize with the palette the artist had developed for the exposition, but actually bring the color to life. In the Court of Abundance, which was distinguished by a red color scheme, Ryan conjured a fantastic "grotto of wizardry," with serpents spouting gas flames, steaming cauldrons, and red "fire" rising "like tinted incense from circular burners, as "rose-colored vapors billowed through the pierced frieze and rolled about the central sphere of the fountain."<sup>135</sup>

For each court Ryan designed a similarly comprehensive scene, using a variety of dynamic and atmospheric effects to convey a miniature world, alive with sensory

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<sup>134</sup> According to Ryan's estimate, General Electric spent \$52,000 USD (equivalent to approximately \$7,28 million USD in 2015) creating and supporting the PPIE's illumination department. Laura Ackley, *San Francisco's Jewel City: The Panama-Pacific International Exposition of 1915* (San Francisco, CA: Fine Arts Museums of San Francisco; Oakland, CA: University of California Press, 2015).

<sup>135</sup> Todd, *The Story of the Exposition*, 347.

stimulations. The fantastic nature of Ryan's artistry conveyed an almost a "narcotic" experience, with some claiming it nothing short of a revelation.<sup>136</sup>

### **The Tower of Jewels and the Scintillator**

With an archway larger than that of the *Arc de Triomphe*, the 435-foot Tower of Jewels dominated the horizon of the exposition, serving as the fair's most prominent landmark. Decorated with numerous allegorical statues and murals depicting the triumph of the West, the tower exemplified San Francisco's bid for recognition as a city of international cultural significance.<sup>137</sup> By 1915 however, a centrally located tower laden with iconographic significance was far from an innovation in terms of exposition design. To distinguish San Francisco's tower from previous exposition towers, especially Buffalo's Electric Tower, Ryan suggested the "Tower of Jewels" concept, proposing to animate the tower with prismatic lighting effects, created by draping the building with cut-glass "jewels" colored to imitate the flashing effect of diamonds, rubies, sapphires, and emeralds. After some discussion, Ryan's suggestion was approved by the planning committee and 130,000 "Novagems" were commissioned from an Austrian glassmaker.<sup>138</sup> Each Novagem was backed by a mirror and individually suspended from the tower, allowing it to be animated with the slightest breeze. During the day the gems shone under natural sunlight, and after dark they sparkled as the beams of fifty-four searchlights cast light on the tower from all sides. While some on the planning committee felt that Ryan was overstepping his boundaries

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<sup>136</sup> Neuhaus describes the experience of Mullgardt's Court of Abundance illuminated on a foggy night as "almost narcotic." Neuhaus, *The Art of the Exposition*. See also John Winthrop Hammond, *Men and Volts: The Story of General Electric* (Philadelphia, New York: J.B. Lippincott Company, 1941), 364-366.

<sup>137</sup> Todd's description of the symbolic content of the Tower of Jewels echoed the manifest destiny narrative of the American west: "It was glorified with heroic sculptures, the allegory of western history and of the irresistible advance of white men to the western ocean." Todd, *The Story of the Exposition*, 305.

<sup>138</sup> Hammond, *Men and Volts*, 364-366.

with the introduction of applied architectural ornament and programmatic content, the Tower of Jewels was successfully implemented despite this initial opposition.<sup>139</sup>

Unquestionably the most popular of Ryan's spectacular nighttime illumination performances was the "Scintillator"—a seemingly supernatural effect able to fill the horizon—created by a battery of forty-eight searchlights with changeable colored filters, whose fanning rays illuminated the harbor three nights a week throughout the duration of the fair.<sup>140</sup> Ryan positioned the Scintillator in the far corner of the Yacht Harbor, so that the movements of the mighty bank of spotlights could project colored beams against the fog of San Francisco Bay. On clear nights he created his own fog with tremendous clouds of steam produced by a stationary passenger locomotive located near the harbor's edge. Operated by forty-eight men from the Marine Corps, the Scintillator could produce such varied motifs as "Scotch Plaid," "Ghost Dance," and "Fighting Serpents."<sup>141</sup> Over the duration of the exposition, Ryan and his staff developed over three hundred individual themed effects that could be produced by the well-rehearsed Marines. The overwhelming impression of the Scintillator as it enveloped the horizon was heralded in numerous accounts as evidence of man's triumph over nature. As one contemporary source suggested, "Persons familiar with Aurora Borealis in her best days declare that by contrast with the 'Scintillator,' she has never really been a success."<sup>142</sup>

### **Object Lessons In an Electrified Future: G.E. at the Pan-American**

The great popularity of the architectural lighting and spectacular illumination at the Panama-Pacific International Exposition demonstrated yet again the promotional value of electric light, and General Electric sought to make the most of their contribution to the fair with their

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<sup>139</sup> Hall, "The General Electric Company's Exhibits," 562; and Hammond, *Men and Volts*, 365-366.

<sup>140</sup> Nye, *Electrifying America*, 58-63.

<sup>141</sup> Ryan, *The General Electric Review*, 582.

<sup>142</sup> Todd, *The Story of the Exposition*, 348.

own publicity campaign. Highlighting the many benefits of electrification to the exposition in a special issue of the *General Electric Review*, the company credited their products and people with the timely completion of the exposition grounds and buildings, suggesting that the reason the exposition was completed on time was “due in large measure to the service rendered by electricity. As the Exposition stands today, it may be said from many standpoints to be a tribute to the progress and efficiency of the electric industry.”<sup>143</sup>

George Weed Hall, Director of General Electric’s Advertising Department, provided a detailed account of the company’s many contributions in the special issue, indicating that it was G.E. lamps that illuminated the construction grounds after dark, making around-the-clock construction schedules possible, and G.E. motors that ran the exposition’s extensive construction machinery. Furthermore, as Hall suggested, even after construction and installation, G.E.’s engines were required to operate and maintain displays throughout the fair.

G.E.’s audacious claim of nearly universal credit for the timely completion of the fair’s construction and the running of many of the exposition displays, hints at the company’s growing influence and control of the industry, suggesting the extent to which electricity and electrical applications were infiltrating all aspects of American life by the early twentieth century. Unlike previous fairs, organizers for the Panama-Pacific did not dedicate a specific palace or exhibition hall to the display of electricity, but instead demonstrations of electric appliances, applications, vehicles and technology were integrated throughout the exposition palaces. One might argue that the discarding of an exhibition building dedicated to an electricity exhibit was more indicative of the increasing domestication of electricity in the United States and the growing confidence and dominance of the American electric industry.

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<sup>143</sup> Hall, “The General Electric Company’s Exhibits,” 563.

While lacking a dedicated electricity building, G.E. did not suffer from a lack of representation, hosting a number of its own exhibits, including “The Home Electrical,” which was situated within the Manufacturer’s Palace, adjacent to the Court of Abundance. A full-scale “Spanish-California bungalow design of moderate cost,” the Home Electrical demonstrated how “electrical energy is converted into light, power and heat to perform many of the most important household tasks.”<sup>144</sup> The purpose of this demonstration home was to convince the millions of visitors who came to the Panama-Pacific exposition that electricity could be easily, inexpensively, and beneficially utilized, eliminating the drudgery of household chores, providing unimagined conveniences, and heightening the experience of the “finer things in life.”<sup>145</sup> Designed to deliver key industry messages tailored to middle class visitors, the exhibit reinforced G.E.’s imagining of the ideal electrified American home. From the courtyard entrance of the Home Electrical exhibit visitors could glimpse a large luminous G.E. monogram comprised of “jewels” similar to those decorating the Tower of Jewels and lit by searchlights mounted on the roof of the house as they queued for the exhibit. The well-recognized trademark, shimmering with projected electric light, provided a visual and symbolic connection for visitors between the electrical wonders on display in the Home Electrical with the iconic centerpiece of the exposition. In so doing it also miniaturized the spectacle of the Tower of Jewels, translating it to the scale of the individual, connecting G.E.’s brand messaging to the fairgoer experience.

Moving through the courtyard towards the entrance of the Home Electrical, visitors would also pass the “Mazda Service” research laboratory exhibit, which in addition to a plethora of lamp related technologies, offered fairgoers interesting “object lessons” including a specially configured grandfather clock. With each swing of the pendulum, a “lone penny”

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<sup>144</sup> Don C. Shafer, “The Home Electrical at the Panama-Pacific International Exposition,” *General Electric Review*, 6 (June 1915): 572-578.

<sup>145</sup> Hall, “The General Electric Company’s Exhibits,” 562.



would fall down one side of a glass-enclosed compartment, and on the next swing three pennies would fall down the other side. The three pennies illustrated the cost of electric light from an “old style carbon lamp,” while the “loner” penny represented the cost of the same amount of light from a “modern Mazda lamp.”<sup>146</sup> Literally demonstrating the financial benefit of Edison’s Mazda bulbs to the individual fairgoer’s pocket book, savings that increased with each sweep of the pendulum, G.E. made a direct proposition to consumers.

The Home Electrical was much more than a material prediction of the electrified lifestyle that was to unfold over the next four decades; it was also a portal inviting visitors to see into other worlds and realms. In the courtyard adjacent to the Home Electrical was a display comprised of a cut-away wall, exposing the wiring for the hotel kitchen (another electrical display itself), which demonstrated how such items as a doorbell, buzzer, and telephone, as well as other domestic electrical wiring should be installed. Although the average fairgoer was probably not inclined to wire their own homes for electrical appliances, such a demonstration illustrated the engineering behind the magic and the internal workings of an electric home.

Most audacious, situated at the back of the Home Electrical, was one of the exposition’s substation rooms “left open to the public at the request of the General Electric Company, to form part of its exhibit.”<sup>147</sup> Operated by the exposition, and as with many other electric-related aspects, G.E. was happy to take credit for it by association. The exhibit emphasized that the substation furnished current for the general and ornamental illumination of the exposition grounds. Enclosed by the Home Electrical on one end and the transformer room on the other, the substation reiterated the connection of the individual to the entire spectacle of electric light at the fair. Symbolically, it was as if the Home Electrical was powering the Panama-Pacific’s nocturnal fairyland, and in case this was not abundantly clear,

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<sup>146</sup> Ibid., 565.

<sup>147</sup> Ibid., 567.

G.E. marked off the operating area of the front of the substation with six ornamental arc lamps connected by brass chains, of the same design as those used throughout the expositions grounds. From the wires buried inside the walls, to the electric teakettle, and the lighting and the heat, electricity flowed through the Home Electric and out through the substation to light the whole of the fair and the idealized modern city of the Panama-Pacific.

The Home Electrical was an early but unmistakable indication of where the American electric industry would focus attention in the coming decades, as increasing effort went into developing a broad-based consumer market for electricity, as discussed further in Chapter 3.<sup>148</sup> While the industry's displays at previous United States fairs had featured such impressive technological relics as dynamos, generators, telegraphs and motors, the Home Electrical demonstrated GE's shrewd awareness of the need for diversification and the necessity of capturing the imagination of the consumer marketplace.<sup>149</sup>

The promotion of General Electric's products and services was not confined to the Home Electrical or the Manufacturer's Palace. General Electric also had a significant presence in the Palace of Transportation, where they exhibited "all kinds of apparatus for electric railways, representing the latest developments in modern city and interurban electric service," and many more devices that General Electric determined essential to the functioning of the modern electrified city.<sup>150</sup> If the exposition was itself to be a microcosm of the modern world, expressed as an idealized city, then General Electric's promotion of the San Francisco fair as an "exposition of the greatness of electricity" and a "tribute to the progress and efficiency of the electrical industry," was certainly a bid for the centrality and benefit of electricity to all aspects of modern life.<sup>151</sup>

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<sup>148</sup> See Chapter 3, "Gendered Discourses and Practices," 142-154 and 159-179.

<sup>149</sup> Juliet Kinchin and Aidan O'Connor, *Counter Space: Design and the Modern Kitchen* (The Museum of Modern Art, 2011).

<sup>150</sup> Hall, "The General Electric Company's Exhibits," 568.

<sup>151</sup> *Ibid.*, 561.

General Electric's promotional strategy, as exemplified by the company's material and financial contributions to the planning and construction of the Panama-Pacific International Exposition, their support of Ryan and his illumination laboratory, as well as by the use of their motors and products in many of the fair's exhibition palaces, proved to be highly successful in raising levels of electricity use well beyond the life of the fair. General Electric's A.F. Dickerson, Ryan's assistant at the San Francisco exposition, later described the benefits of General Electric's participation in the fair, "Following the Exposition in San Francisco the demand for more light resulted in increasing the intensities of street lighting in the business districts fifteen times, with corresponding increases in window and sign lighting."<sup>152</sup> Furthermore, Dickerson suggested that the industry's continued participation in large-scale expositions and illumination displays would result in permanent increases in electrical load, promoting "good will between the central station and the public" and serving as "an advertising agency for the entire industry."<sup>153</sup>

### **The Shop-Window of Civilization**

By the close of the Panama-Pacific International Exposition, both the fair's organizers and General Electric had realized their initial objectives. San Francisco made exposition history awing visitors and critics alike with Ryan's new system of architectural floodlighting and the colorful, ever-changing spectacle of the Scintillator. Praise of Ryan's floodlighting in the popular press spurred a wave of architectural floodlighting installations across the United States as General Electric had hoped. This trend for architectural floodlighting reached a peak in the later 1920s and 1930s, brining in millions of dollars of business to G.E. and its subsidiaries.<sup>154</sup> The San Francisco exposition also provided G.E. with the opportunity to

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<sup>152</sup> A.F. Dickerson, "Spectacular Lighting," National Electric Light Association, *Proceedings of the Forty-Seventh Convention* (1924): 485-498, as quoted in Nye, *Electrifying America*, 65.

<sup>153</sup> Nye, *Electrifying America*, 65.

<sup>154</sup> See Neumann and Champa, 45-55.

expose millions of visitors to the conveniences of the electrified future with the Home Electrical and its other exhibits. The number of visitors who passed through General Electric's exhibits was considerable. By the closing of the exposition in December 1915 roughly nineteen million admissions had been sold. Unlike many other American world's fairs, the Panama-Pacific was a popular and financial success, with final profits exceeding two million dollars.<sup>155</sup>

San Francisco's Panama-Pacific International Exposition marked the dawning of a new era in American life. It signaled the emergence of a global era, one where the West met the East on the Pacific Coast of the United States. It signaled the arrival of modern modes of communication and transportation. The opening of the Panama Canal promised new wealth in South America and the Pacific. The American West was settled, and after the success of San Francisco's exposition, the region could claim civilized cultural centers to rival those of the East Coast. Electricity was no longer confined to the domain of mysterious industrial dynamos and glaring arc lamps; it was an electric piano and a built-in vacuum in the Home Electrical, it was a spectacular aurora conjured not by nature but by human hands and imagination, it was luminous shadows and architecture made more tantalizing by night than day. Despite the outbreak of World War I, the optimism underscoring the Panama-Pacific exposition was characteristic of the nation as a whole in this period.

This optimism was predicated upon the nation's exponential growth in the mass-production of consumer goods, and the emergence of a never before seen mass consumer culture.<sup>156</sup> Both were put on display at the Panama-Pacific. Each day eighteen cars rolled off the operational assembly-line production of Ford's Model-T inside the Palace of Transportation. G.E. likewise exhibited a miniature lamp factory, which illustrated the full

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<sup>155</sup> Findling and Pelle, *Historical Dictionary of World's Fairs and Expositions*, 225.

<sup>156</sup> See Gary Cross, *An All-Consuming Century: Why Commercialism Won in America* (New York, Columbia University Press, 2000), chapter 2 especially.

assembly process for its Mazda light bulb, each completion signaled when the bulb was illuminated. There was also a two-story color press on display capable of producing over 1.7 million newspaper pages an hour. Then there was the demonstration of the first transcontinental telephone line, collapsing geographical distance, instantly transforming the pace and reach of American culture. A myriad of other consumer products and technologies were on display or demonstrated throughout the exposition, and in this sense, there is ample evidence that fair organizers achieved their aim for the exposition to serve as the “Shop-Window of Civilization.”<sup>157</sup>

Certainly this can be said of G.E., which sold itself as the life-force of the fair—anywhere one went electricity and electric light was there. Electricity was no longer the focus of the fair as it had been in Buffalo; in San Francisco it became the show itself. Electricity and electric light, in the hands of able engineers and designers, produced the theater of world’s fairs at the Panama-Pacific, a dramatic tradition that would become part of the aesthetic language of popular American consumer culture.

### **Chapter 1: Conclusion**

Nowhere is the indivisibility of American cultural and industrial life more transparent than at United States world’s fairs of the late nineteenth century and the first decades of the twentieth century. At these fairs the display and promotion of American technology and industrial innovation was central to the positioning of Anglo-North American society and culture as the most highly advanced and therefore civilized. Arguably the most visible, as well as most popular, element in the promotion of American industry-as-culture was the spectacular display of electric light. The expressive and propagandistic use of electric illumination at American expositions during this period encouraged the association of electricity, at least

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<sup>157</sup> Geddes Smith, “A Shop Window of Civilization,” *Independent* 82, no. 3473 (28 June 1915): 535.

symbolically, if not literally, with cultural progress. From the colorfully illuminated fountains and delicate incandescent outlining of the World's Columbian Exposition to the dramatic architectural floodlighting and the dynamic spectacle of the Scintillator at San Francisco's Panama-Pacific International Exposition, electric light provided the stagecraft for the evolving narrative of America's cultural achievements and progress. The exhibits devoted to the display of electrical technology and industry also served to connect the sublime experience of electric illumination to its commoditized and domesticated applications.

Also significant in terms of the development of the discipline of lighting design, a very powerful and singular patriarchy was established for exhibition illumination in the United States over the course of these fairs, beginning with Stieringer in Chicago, his collaborations with Rustin in Omaha and Buffalo, to Rustin's solo work for St. Louis, and the culmination of this incredible trajectory in Ryan's lighting scheme for the San Francisco exposition. The design of the electric lighting for all the major American fairs was entrusted to this lineage, supported, financed and protected by G.E.

Astutely, G.E. and Westinghouse appropriated the overriding narrative of all United States fair's from New York's Crystal Palace onwards, a mythology wherein the nation's ingenuity and technological aptitude served as the engine and driver of American progress. They replaced the Corliss engines and magnificent industrial machinery of the mid-nineteenth century with the magic of electricity. They were so convincing in selling this idea to local and Federal government bodies, local and regional business leaders, and popular audiences that electricity and modern civilized man were continually cast as co-dependent at United States world's fairs. Electric light and its integrated application to the ideal cities created for each exposition left an indelible impression of an animated nocturnal cityscape in the popular imagination of fairgoers from around the world.

Chapter 2 will carry many of these themes forward, examining the dissemination and integration of electric lighting across the built environment in the interwar period. Exploring shared discourse and ideas about the connection between electric light and modern architecture and aesthetics, it will draw connections between these theories and new applications of electric light and the development of modernism in the United States. Analyzing both popular and theoretical treatments of electric lighting during this period, across a breadth of disciplines, including architecture, interiors, exhibition design, theater and the arts, Chapter 2 will set out the context and the conditions for alignment of electric light with modernism in the United States during the 1920s and 30s.

## CHAPTER 2: INVISIBLE MECHANISMS OF MODERNISM

### **Introduction: the Aesthetics of Abstraction**

San Francisco's Panama-Pacific International Exposition was intended to portray a microcosm of the world, a world that represented the most advanced cultures, and how they might be formulated as a modern metropolis with advanced technologies, assembly line production, a host of consumer products and conveniences, and a luminous nightly spectacle that transformed the exposition grounds and buildings with new applications of electric light. If the Panama-Pacific was indeed successful in crafting such a microcosm, it also must be conceded that it was an American interpretation of the most distinctive and valuable aspects of the emerging modern age. While such dream worlds as those built for America's world's fairs were ephemeral and more useful to historians in what they captured and represented of their time than for what they predicted, the Panama-Pacific does hold a few valuable clues for approaching the study of the integration of electric light across American culture in the first few decades of the twentieth century. While the architecture of the fair was still firmly grounded in Victorian revivalist tradition, the application of electric lighting had leapt ahead, freed from the tracing of historicizing ornament and utilized in service of engaging audiences in the nocturnal perception and experience of the built environment. Such techniques and the vast range of luminous effects possible with indirect, reflected, and projected lighting applications would play a central role in various reconsiderations of the nature of modern art, design, architecture and life in both Europe and the United States in the first three decades of the twentieth century. The development of a body of literature and practice by individuals involved with the theater reform movement on both sides of the Atlantic is a largely unrecognized but central force in the introduction of new theories of and approaches to



lighting design. This chapter will highlight and explore these connections and in particular, the widespread appropriation of both the techniques and theories of modern stagecraft to a variety of contexts—from the modern interior to the museum and the show windows of America’s department stores and main streets.

The growing influence of modernism and the way in which architects, designers, and critics in the United States negotiated its terms is another important aspect of the development and expansion of the uses and meanings of electric light in the United States during the 1920s and 30s. While modernism’s slippery origins have been traced to key concepts and works introduced in Europe as well as the United States in the later nineteenth and early twentieth century, prominent Americans like Alfred Barr, Jr. and Philip Johnson utilized their social and cultural standing to advocate for modernism, presenting its principles and products (both architecture and artifacts) in high profile exhibitions at New York’s Museum of Modern Art.<sup>158</sup>

Similarly art and design critics like Sheldon Cheney broadly interpreted the tenets of modernism as a framework for a new American style complementary to both the machine and consumer culture. Revisiting the work and writing of a number of such individuals influential in the promotion of a modernist agenda, this chapter will explore the role of electric light in mediating, embodying, and aestheticizing key aspects of modernism as it developed in the United States.

The paradox of ornament revealed in the pursuit of modernism forms a central discourse in this period. While electric lighting at world’s fairs and other specialized environments of the later nineteenth-century was first introduced to popular audiences as a spectacle of display, emphasizing technical bravado and the sheer quantity of lamps, after the

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<sup>158</sup> For example, Sigfried Giedion, *Space, Time, and Architecture* (Cambridge, MA: Harvard University Press, 1941); Nikolaus Pevsner, *Pioneers of Modern Design: From William Morris to Walter Gropius* (London: Penguin, 1975).

turn of the century effort was directed to demonstrating the beneficial and beautifying effects of electric light (rather than the lamps themselves). Instead a more purposeful integration of the varied effects of electric illumination—such as atmosphere, the articulation of surface characteristics, the manipulation of spatial volumes, and other aestheticizing and emotive effects—was sought. Concurrently attending to the significant problems presented by modernism’s jettisoning of ornament—such as how to communicate architectural intent, cultural hierarchies and economic value, visual interest, character and aesthetic refinement—a new and perhaps previously unrecognized role for electric lighting was identified and promoted by key individuals from a variety of disciplines, including illuminating engineering, architecture, and arguably most influentially, the theater arts.

While there are a number studies that address the rich intersection of electric light and modernism in United States during this period, these authors have typically treated electric light in an isolated manner, either as a technological or aesthetic innovation or as a minor theme within a larger narrative of the development of modernism or modern architecture and design in the United States.<sup>159</sup> Neumann, Jakle, and Nye, among others, have contributed more substantial studies, providing a broader understanding of the connection between electric light and the development of modern architecture and urban environments in the United States during the twentieth century.<sup>160</sup> However, these scholars have focused most closely on the production of modern American architecture, cities, and streets with architectural and urban planning practice most often at the center of their studies. These histories to a lesser or greater extent have given limited attention to the interaction of electric

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<sup>159</sup> See for example, Alastair Duncan, “Art Deco Lighting,” *The Journal of Decorative and Propaganda Arts* vol. 1 (Spring, 1986), 20-31; William Leach, *Land of Desire: Merchants, Power, and the Rise of a New American Culture* (New York: Pantheon Books, 1993); Christopher Innes, *Designing Modern America, Broadway to Main Street* (New Haven: Yale University Press, 2005); and Kristina Wilson, “The Avant-Garde and the Conservative in Lighting Design: The Modernism of Walter W. Kantack,” *Studies in the Decorative Arts*, Vol. 14, No. 2 (Spring–Summer 2007): 117-144.

<sup>160</sup> See Jakle; Neumann and Champa; and Nye, *Electrifying America*.

lighting across the broader spectrum of design and cultural production in the United States during the twentieth century.

This chapter, therefore, seeks to bring forward electric light as a fundamental and critical consideration in the mediation of modernism in the USA, one that provides continuity and connection between groups and ideas that have often been treated in isolation within the historical record. Nowhere is the advantage of such an approach more revealing than in the study of the development of the modern American interior—an area of study that also suffers from its long-held position in the scholarly shadows of architecture. Already at a disadvantage, the central role of electric light in the transformation of the modern interior aesthetically, socially, and technologically has remained largely obscured through such disciplinary biases. Just as the floodlighting of America's skyscrapers and dazzling array of electrified signs, streetlights, and shop windows of the nation's white ways helped forge a new nocturnal landscape for the modern city, so too electric lighting transformed the design, use, experience, and appearance of modern interiors in the same period. From domestic interiors to cafes, movie places, museums and department stores, electric lighting not only symbolized modernity and affluence, but also provided unprecedented glamor and convenience without transgressing the fundamental tenets of modernism. The central role of electric lighting in the imaging and articulation of American modernity, both aesthetically and culturally, forms a principle theme of this chapter. Through the examination of popular and professional literature promoting electric light and its fundamental difference from gas or flame based illuminates, this chapter highlights discussions and explorations of the immateriality of electric light as an aesthetic medium, and its association with core aspects of modernity.

As a new technology, one that represented a real and demonstrable difference from previous lighting technologies, great optimism accompanied the exploration of electric

lighting in the early decades of the twentieth century. From researchers at General Electric's laboratories, to new stagecraft designers, to architects, industrial designers, and a host of cultural critics, electric light promised new means of shaping space, experience, and perception. These investigations would play a key part in the development and dissemination of a modernist agenda in the United States, synthesizing aspects of European avant-garde modernist theory and practice with the particular concerns and proclivities of American culture during the interwar period.

### **From Gas to Electric Lighting**

Electric lighting fixtures and illumination techniques hold a unique position in the discourse and development of the modern interior. Distinct from previous flame-based sources, the introduction and domestication of electric lighting technologies begged for the design of new lamp forms and applications. Flame-based illumination sources like gas and oil had specific requirements in order to function properly and efficiently: they needed to burn upright, to be supported away from walls and ceilings, and to have access to a continuous supply of fresh air for combustion. Furthermore, most nineteenth-century flame-based illuminates were quite dim and shading was not recommended. Such pre-electric fixtures also needed to be easily accessible in order to be lighted and extinguished with each use. Because light was produced by exposed combustion, flame-based illuminates also created heat and smoke, and the risk of fire was a concern for some.<sup>161</sup>

The intrinsic properties of electric lighting however, suggested the possibility of different approaches to interior illumination. Assuming an interior was wired for electricity, it was possible to install electric light in a much greater variety of locations and positions. Even with early incandescent light sources, there was a reduction in heat output compared to

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<sup>161</sup> Schivelbusch, *Disenchanted Night*, 1-49; 155-188.

lighting by gas or candles, and the byproducts of smoke and fumes were displaced from the interior to the electrical power station or the source of electrical generation. With electric lighting there was no longer a requirement to provide a flow of fresh air through the interior to replenish oxygen or ventilate smoke and fumes. As such, electric illumination offered a level of freedom and control beyond that possible with flame-based illuminates.<sup>162</sup>

Indeed, the promise of electric lighting was widely heralded as an affordable and accessible solution to the challenge of artificial illumination in the early decades of the twentieth century—most prominently by the American electric industry, which stood to benefit tremendously by encouraging popular and professional interest in electric lighting. While a host of electric lighting applications had been popularly demonstrated and promoted in the later years of the nineteenth century, as discussed in Chapter 1, for many Americans electricity, and therefore electric light, was still an expensive, little understood and threatening technology at the turn of the century.<sup>163</sup>

### **Challenging Old Habits and Familiar Forms**

However by the early years of the twentieth century electricity and the long distance reach of alternating current distribution was bringing electric light to a greater section of the American population. While urban areas and those serviced by electric railways were the first to be widely electrified, by the 1930s seventy-percent of American households were electrified.<sup>164</sup> Rural and farm communities were the last demographic to be electrified, in part because the electric industry did not believe that population densities in such areas would sustain the

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<sup>162</sup> Nye reiterates the popular myth of the separation of fire from light with the introduction of electricity, but such a position fails to recognize the role of combustion in the production of electricity from its most common sources. Nye sets out his argument in *Electrifying America*, 2.

<sup>163</sup> See Chapter 1, “Narratives of Progress,” 25-41; Such popular concerns were fueled by the ‘Battle of Currents’ waged between Westinghouse and Edison in the late 1880s over the use of alternating or direct current—a main aspect of which was the relative safety of each system. See Jill Jonnes, *Empires of light: Edison, Tesla, Westinghouse, and the Race to Electrify the World* (Random House Trade Paperbacks, 2004).

<sup>164</sup> Nye, *Electrifying America*, 287-338.

necessary infrastructural investment. Despite such disparities in distribution, on a popular level electric illumination was associated with progress, scientific advances, modern convenience, affluence, and glamor. Such connotations of electric lighting were reinforced by the industry, design professionals, and popular media, and from the 1920s forward, electric lighting was increasingly promoted as a means of modernizing, harmonizing, enhancing and controlling the aesthetic quality of the interior. The significance and difficulty of this transition, culturally as well aesthetically, from flame-based illumination sources to electric light is evident in both the professional discourse and popular literature of the period.

Indeed, it would take some time for fixture designers, manufacturers, architects and interior designers to come to terms with electric lighting. Old habits and familiar forms were easily adapted to the new technology with little innovation. Many saw no issue in simply converting a gas ceiling pendant or wall-mounted fixture for electricity. Overlooking both the necessity and opportunity to rethink artificial lighting in the interior after the introduction of electric light, time would pass before there was a notable outcry to modernize lighting fixtures and applications to accommodate and take advantage of the intrinsic properties of electric illumination.<sup>165</sup>

Matthew Luckiesh, Director of Applied Science at General Electric's Nela Park laboratories, was an early and important figure in the industry's efforts to educate manufacturers, designers, and consumers about electric lighting.<sup>166</sup> Trained as a physicist, Luckiesh had joined General Electric in 1910 and quickly became a respected authority on the principles and properties of electric light—particularly in relation to color, vision, illusion and perception. In 1925 he published *Lighting Fixtures and Lighting Effects*, a practical guide

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<sup>165</sup> Adrian Forty makes a similar point about the introduction of electricity to the domestic environment. See Forty, *Objects of Desire: Design and Society, 1750-1980* (London: Thames and Hudson, 1986), 182-206.

<sup>166</sup> Matthew Luckiesh (1883-1967) was a career-long employee of General Electric, who specialized in research into the physiological and psychological effects of electric light. Luckiesh published extensively, with over twenty-five books and several hundred articles to his name. On Luckiesh and his contributions to illuminating engineering, see Nye, *Electrifying America*, 363-68 and David E. Nye, *Image Worlds: Corporate Identities at General Electric, 1890-1930* (Cambridge, Mass.: MIT Press, 1985).

to electric lighting fixture design and use. In the chapter “Replacing Flames with Electric Lamps,” Luckiesh outlined the basic properties of electric light as opposed to flame-based illuminants, addressing the difficult transition from gas to electric for many fixture designers and manufacturers:

The most obvious step was to replace the older flame light sources by the new electric-filament lamps. This was a natural result of habit, but this habit is too persistent. It is true that many beautiful and very suitable fixtures have been made by the mere substitution of the new light sources for the old without any appreciable change in the design of the older fixtures except to provide for wiring and sockets.<sup>167</sup>

While he conceded the occasional successful adaptation of older flame-based fixtures to electricity, Luckiesh advised fixture designers to think beyond traditional illumination typologies and to “celebrate this greater freedom by creating lighting fixtures which utilize these modern possibilities.”<sup>168</sup> Critical of what he described as the careless, lazy, and incorrect utilization of electric light, Luckiesh accused fixture designers of needlessly wasting light “because of the lack of attention...to well-known laws of light and properties of reflecting and transmitting media.”<sup>169</sup> Luckiesh however, had no issue with the use of historicizing styles as long as the properties of electric light were correctly utilized. In *Lighting Fixtures and Lighting Effects*, Luckiesh provided detailed drawings of an extensive array of historic and popular fixture designs properly adapted for electric illumination, including such examples as “modern Dutch” and “modern Elizabethan”.

Although typically an advocate of maximum lighting efficiency in any fixture design, Luckiesh allowed for exceptions when a case could be made for significant aesthetic gain in the overall composition of the room. He wrote, “When we consider beautifying interiors and making them charming and expressive of a certain spirit or mood, efficiency, used in its

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<sup>167</sup> Matthew Luckiesh, *Lighting Fixtures and Lighting Effects* (New York: McGraw-Hill, 1925), 192.

<sup>168</sup> *Ibid.*, 192-93.

<sup>169</sup> *Ibid.*, 192-93.

narrow sense, is not the primary viewpoint.”<sup>170</sup> Situating lighting fixtures within a decorative continuum including other key elements of the interior, Luckiesh elaborated on this point:

No one inquires into the efficiency of a decorative vase, of a picture on the wall, of draperies, or of article of furniture. A room decorated and furnished with efficiency, as used in a narrow sense, uppermost in mind would not have beautiful rugs and silk draperies...It would be a proper place to confine those who cry for unreasonable efficiency until they learned that efficiency of lighting fixtures and of lighting effects, as with many other features of interiors, is the ratio of satisfactoriness to cost.<sup>171</sup>

Despite Luckiesh’s conviction that no one would question the efficiency of draperies, vases, or furniture, many in fact were challenging such notions and objects. In the decade following Luckiesh’s publication in the USA, the challenging issue of the appropriate character and purpose of the decorative arts in a modern age would come to the fore, and in so doing create new opportunities and potential for the use of electric light in the design and decoration of the interior.<sup>172</sup>

### **Electric Light and the Modern Decorative Arts**

As a new and fundamentally modern technology, not to mention an increasingly essential utility of modern life, electric lighting fixtures and applications featured prominently in reconsiderations of the decorative arts and design in the 1920s and 30s. For obvious reasons, initial attention was largely given to the appropriate design of electric lighting fixtures, but by the early 1930s attention increasingly turned to a host of effects possible with electric light—architectural, spatial, psychological and aesthetic. In the process of this curious evolution a nearly silent transferal took place. As the electric lighting fixture was stripped of decoration and formulated as utility, electric light itself took on a much more important position in the articulation of surface effects and the aestheticization of modern environments, playing a

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<sup>170</sup> Ibid., 192-93.

<sup>171</sup> Ibid., 194.

<sup>172</sup> See for example, Le Corbusier, *The Decorative Art of Today*, trans. James Dunnett (Cambridge, Mass.: MIT Press, 1987), 69-79.



central role in the dematerialization of ornament and decoration, and providing highly adaptable mechanisms with which to shift practices and approaches from material to immaterial decorative effects in the modern interior.

### **Sheldon and Martha Cheney's *Art and the Machine***

One of the first American critics to offer a sustained consideration of electric light's potential as a fundamental medium of modern design was Sheldon Cheney, who in collaboration with his wife Martha published these ideas and others in their 1936 survey of American industrial design, *Art and the Machine*.<sup>173</sup> Although self-consciously aligned with the ideological and aesthetic tenets of European modernism, *Art and the Machine* traced the emergence of a distinctly American machine age sensibility to the nation's historical strength in industrial technology, design, and manufacturing. As the Cheneys argued,

Obviously there is a new art, existent in machine-made mass products: industrial design. It is not an esoteric and precious manifestation but a practical expression embodied in utilitarian forms increasingly familiar in the daily life of the average person. Everywhere it condemns the standards of taste by which we formerly chose our furnishings and our 'ornaments' and foreshadows a new universal style.<sup>174</sup>

Grounded within the American interwar context and condition, from the outset the Cheneys addressed their book to the American people and more specifically, to the "average person" who they describe as the "ultimate consumer."<sup>175</sup> In a surprising break from their contemporary counterparts in Europe and Britain, the Cheney's credited the average American consumer with challenging industry by expressing "his growing dissatisfaction

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<sup>173</sup> While a number of architects, illuminating engineers, and stagecraft theorists and designers discussed the inherent abstraction and modernity of electric light and its appropriateness as an element in modern architecture, interiors, spatial design, and theater, from the research undertaken for this study, it would appear that Sheldon and Martha Cheney were the first to make such a sweeping claim for the role of electric light in modern design. Sheldon and Martha Cheney, *Art and the Machine* (New York: Whittlesey House, 1936).

<sup>174</sup> *Ibid.*, vii.

<sup>175</sup> *Ibid.*, viii.

with the old drab and stereotyped appearance of useful commodities of all kinds.”<sup>176</sup>

Displacing the design or cultural critic as authority and instigator with the “average person”, problematizing the strict rationalism associated with European modernism, enquiring whether or not it allowed a role for aesthetics:

If all ornament is to be sheared off and a new start made...then where does art come in? Can the inventive engineer’s solution in functional form ever properly yield aesthetic values; or does his product emerge as art only when functional form is subject to the same processes, subjective and intuitional in character, which produce painting and sculpture?<sup>177</sup>

In the Cheneys’ interpretation of modernism, the machine was to serve as a “universal tool of execution” in the hands of the artist.<sup>178</sup> Their foregrounding the machine and its deep symbolic connection with American industry and culture, as well as its capacity to be employed in service of the development of the arts in the USA, suggests the imbeddedness of such rhetoric in the nation’s ethos by the 1920s. Such-long held associations between America’s capabilities in technological innovation and engineering and the nation’s cultural progress set out at the world’s fairs in the later nineteenth-century, emerged in the twentieth-century as a rationale for a new modern American style—popularly described in reference to the machine as “machine art” or “machine age” design.<sup>179</sup> This terminology was widely used in the United States during the period roughly bookended by the First and Second World Wars, during which the machine, its manifestations, products, and promise served as a defining force for modern American culture.

### **Industrial Design: the Alliance of Artist and Machine**

Such Depression era optimism regarding the timely pairing of art and industry, or the machine and the aesthetically-minded engineer, permeates *Art and the Machine*. Framing the

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<sup>176</sup> Ibid., viii-ix.

<sup>177</sup> Ibid., viii.

<sup>178</sup> Ibid., x-xi.

<sup>179</sup> See Richard Guy Wilson, *The Machine Age* (New York: Harry Abrams; Brooklyn Museum of Art, 2001), 16.

nation's historic underdevelopment of the decorative arts as a benefit rather than a deficit, the Cheneys argued that the machine aesthetic was an extension of American sensibilities and functionalist traditions. They suggested that the nation's heritage of crafting utilitarian objects and tools suited to the requirements of the everyday life of a young nation provided a direct precedent for modern industrial design. Advancing this logic one step further, they identified the maturing of this indigenous approach in American industrial processes, methods, and materials. More than just a distinguishing national characteristic, the Cheneys named the United States a pioneer in the development of "a new world of appearances, beautiful with the peculiar beauty of the machine," calling for the "alliance of artist and machine."<sup>180</sup> This alliance was to provide the foundation for the (new) discipline of industrial design, which in the Cheneys' definition, took as its subject nearly all of the built environment—from objects, to interiors, to architecture, and even stagecraft. Such a far-reaching definition underscored their position that industrial design was the art shaping the twentieth century.

Differentiating areas of specialization within their monolithic view of industrial design, the Cheneys describe the machine age "interior architect" as an "industrial designer working as a specialist."<sup>181</sup> Setting out the methods and objectives characteristic of the industrial designer's approach to the interior, they prioritized the importance of maintaining an "architectural conception of the whole" that was primarily "architectonic rather than decorative" and above all, "directed toward unity."<sup>182</sup> While these principles were the same as those upheld by the architect, the Cheneys suggested that there were some important differences when addressing design of the interior, writing, "In interior architecture, there is, of course, a special significance in qualities of surface capitalized in terms of texture and

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<sup>180</sup> Ibid., xi.

<sup>181</sup> Ibid., 182.

<sup>182</sup> Ibid., 189-90.

color.”<sup>183</sup> Given the nature of such design considerations, in particular the emphasis on unity, structural integrity, and the qualities of surface materials (rather than ornament), electric lighting took on a particularly important role—a point they labored to make, instructing readers that, “lighting is not a surface factor in the old sense. It no longer strikes things. It is, rather, permeatively and unobtrusively filling the space that is the first element of the new architecture.”<sup>184</sup>

This newfound ability to articulate space, emphasize architectural structure, and activate surface qualities with electric light—invisibly, permeatively—was the result of an increasingly diverse array of recessed and indirect lighting applications. In this period, architects and designers were rapidly realizing that a host of new interior effects could be achieved by integrating electric lighting into architectural elements. Rather than focusing on the design of fixtures, attention turned to the design of light, and the use of indirect illumination to accent or unify architectural planes and details, articulate surface textures, and enhance color. This shift embodied the essence of modern interior design (or industrial design according to the Cheneys), not only allowing a greater manipulation of the spatial qualities of the room, but also providing a mechanism for enhancing a range of modern materials and surface effects. Reiterating the necessity of attending to the intrinsic, surface-bound characteristics of different materials, they wrote,

All materials—wood, glass, metal, also textiles and painted surfaces—have their own inherent modern texture values, just as they have their own color values. They are used, and with them a secondary range of interior materials including cork, plastics, and leather, for the fullest capitalization of grain, vibration, glint, and glow...texture often does the work formerly done by applied pattern.<sup>185</sup>

In the modern interior light, whether daylight newly channeled into the interior through large glass apertures or electric light focused through architecturally integrated applications,

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<sup>183</sup> Ibid., 182; 189-90.

<sup>184</sup> Ibid., 200.

<sup>185</sup> Ibid., 193-4.

provided the decorative and atmospheric effects formerly achieved largely with applied ornament. In many ways this was the crux of the modernist assimilation of applied ornament and surface beauty; through the direction and design of light, the intrinsic cultural value of ornament was transmitted to the characteristics of the surfaces themselves.

Emphasizing immateriality, as well as the capacity to enhance and modulate surface-bound material effects, the Cheneys situated consideration of electric light at the center of the composition of the modern built environment. However they were careful to distinguish between the design of light as a spatial and surface condition and the design and use of lighting fixtures as decorative elements of the interior. Calling attention to the disappearance of visible fixtures in the interiors of modern designers such as William Lescaze, Gilbert Rohde, Paul Wiener and Eleanor LeMarie, they argued for the obsolescence of decorative fixtures in the functional illumination of a room. Recessed, masked, or otherwise architecturally disguised lighting equipment they suggested, should serve as “original sources” of surface and spatial illumination.<sup>186</sup> Lighting the architecture in this way, with electric lighting apparatuses hidden from view, ensured visual unity of the entire interior composition, as they claimed, “The true wonder of modern architectural lighting is in the subtlety possible in the complete room effect, and in the great range of variations that can be played out of invisible mechanisms within the larger harmony.”<sup>187</sup>

While the role of architectural lighting was to provide flexibility in the composition of an overall harmonious interior, the Cheneys also saw room for the inclusion of visible electric lighting fixtures, when treated as works of art. They felt such fixtures functioned in the modern interior as sculpture. For example when describing an adjustable electric lamp designed by Frederick Kiesler they noted the way in which “functional and structural

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<sup>186</sup> Ibid., 193.

<sup>187</sup> Ibid., 202.

elements are combined in a calculated abstract composition.”<sup>188</sup> But such fixtures as the Kiesler lamp were to remain in the role of art, while the lighting for the room was provided by “invisible mechanisms.” This point is made in the Cheney’s discussion of Lescaze’s work; while they noted the excellence of his fixtures, they gave greatest praise to his architectural deployment of indirect light, describing how he utilized “every wall or curtain or major furnishing unit for reflection or diffusion values, with regard to color, texture, and placement.”<sup>189</sup>

As well as enhancing such decorative aspects of the interior, the Cheney’s also identified the fostering of a deeper architectural resonance between exterior and interior with the use of indirect lighting. Visually connecting the façade with the interior, they stated the broadly applied indirect illumination of vertical planes created a “sense of sheer unbroken wall area which has been established in the exterior architecture.”<sup>190</sup> Describing a range of decorative, spatial, and architectural effects, they summarized, “The final, most distinctively machine-age element is electric light, used as the harmonizing and unifying element, now a marvelous flexible instrument in the hands of the designer.”<sup>191</sup>

### **The New Stagecraft**

This particular understanding of the possibilities and potential of electric lighting in the design of the modern interior can be usefully linked to Sheldon Cheney’s long-standing involvement in the American theater reform movement, best known in the United States as the new stagecraft, and more generally with his efforts to communicate the value of modern art to American audiences.<sup>192</sup> His engagement with American theater and modern visual arts

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<sup>188</sup> Ibid., 49.

<sup>189</sup> Ibid., 200-201.

<sup>190</sup> Ibid., 199-201.

<sup>191</sup> Ibid., 190.

<sup>192</sup> On Cheney’s and the new stagecraft in the U.S., see Christin Essin, *Stage Designers in Early Twentieth-Century America: Artists, Activists, Cultural Critics* (Palgrave MacMillan, 2012).

predated his interest in machine age design by several decades. His deep understanding of the efforts and intentions of those seeking to reform modern theater and stagecraft, as well as the leading proponents of modern art in both Europe and the United States made Cheney an important point of connection between the creative practices of theater, architecture, and design, as well as with popular audiences by publishing critical reviews of the theories and practices of these disciplines.<sup>193</sup>

Founding the influential American theater journal, *Theater Arts Magazine*, in 1916, Cheney served as its editor until 1921, and by the mid-1930s he had published a number of books and many articles on modern art, theater and stagecraft.<sup>194</sup> In *The Art Theater*, his 1917 critique of contemporary American theater, Cheney sketched out the guiding aims and objectives of the new stagecraft movement—principles that he would invoke again nearly two decades later when addressing machine age design, emphasizing the potential of color, abstraction, and light to unify and harmonize spatial compositions.<sup>195</sup> Such strategies for abstraction were core to theater reform efforts in Europe, Britain and the USA, and therefore formed a central theme in Cheney’s writing. Real progress in the theater arts, and in the visual arts more generally, required the abandonment of all representation and illusion in service of abstract expression and real aesthetic experience according to Cheney. As he described in *Modern Art and the Theater*:

The general trend of modern art is unmistakably toward abstraction or non-representative means...I wish not to overlook the close connection between progress on stage and progress in the painter’s studio. What is generally called ‘modern art’? In its negative aspect it is a revolt against the representative basis in painting, against descriptive painting, illustrative painting...In its constructive

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<sup>193</sup> See Susan Noyes Platt, “Sheldon Cheney: Crusader for Modernism,” *Archives of American Art Journal*, Vol. 25, No. 3 (1985): 11-17.

<sup>194</sup> Sheldon Cheney, *The Art Theater; a Discussion of its Ideals, its Organization, and its Promise as a Corrective for Present Evils in the Commercial Theater* (New York: A.A. Knopf, 1917); *The New Movement in the Theater* (New York: M. Kennerley, 1914); *A Primer of Modern Art* (New York: Boni and Liveright, 1924); *Stage Decoration* (New York: The John Day Company, 1928); *Expressionism in Art* (New York: Liveright, 1934).

<sup>195</sup> Cheney, *The Art Theater*, 56-73.

aspect it is creation as contrasted with imitation, expression as contrasted with representation.<sup>196</sup>

Arguably, Cheney was unusual among his contemporaries for his ability to move across and between different areas of creative practice and criticism, synthesizing his observations on the changing character of the arts in the modern period. However in the later 1920s his primary interest was the development of modern theater in the United States and much of his writing from this period focused on critiquing and promoting understanding of its principles, the origins of which he largely identified in European theater reform efforts (sometimes referred to as the ‘continental stagecraft’ movement). Cheney identified the two most significant figures in the development of modern theater arts as the Swiss architect and stagecraft designer Adolphe Appia and Edward Gordon Craig, the radical English dramaturge. Both were introduced to the American context largely through critical analysis of their work published by Cheney and others active in the development of modern theater in USA, including Robert Edmond Jones, Jo Mielziner, and Norman Bel Geddes.<sup>197</sup>

### **Adolphe Appia: the “Visual Music” of Modern Theater**

Although Appia’s productive career was brief, roughly spanning from 1885 until his death in 1928, his influence was broad and lasting. From his home in Geneva, Switzerland, Appia wrote prolifically on the need for sweeping reform within the dramatic arts, publishing his first essay in 1891 and by 1928 he had published three books and roughly sixty essays.<sup>198</sup>

Among his best known works was *Die Musik und die Inszenierung*, published in 1898 as a

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<sup>196</sup> Sheldon Cheney, *Modern Art and the Theater* (Scarborough-on-Hudson: The Sleepy Hollow Press, 1921), 4, 9.

<sup>197</sup> See, Thomas Alan Bloom, *Kenneth Macgowan and the Aesthetic Paradigm for the New Stagecraft in America* (New York; Washington, D.C.: Peter Lang, 1996).

<sup>198</sup> On Appia see, Walter R. Volbach, “A Profile of Adolphe Appia,” *Educational Theater Journal* vol.15, no.1 (March, 1963): 7-14; Richard C. Beacham, *Adolphe Appia: Texts on Theater* (London; New York: Routledge, 1993); Denis Bablet and Marie-Louise Bablet-Hahn, *Adolphe Appia 1862-1928: Actor-Space-Light* (London: Calder; New York: Riverrun, 1982).



highly critical rejection of contemporary illusionist theater. In this text, Appia proposed a radical reconfiguration of scenic design, including eighteen illustrations of scenes for Wagnerian operas.<sup>199</sup> Calling attention to the perceptual conflict inherent with the use of painted scenery on wings, set pieces and backdrops in juxtaposition with the living physicality of the actor, Appia argued that two-dimensional painted scenery when used “to convey a picture” really only created “a painted plasticity which is illusory, contrasting with the real plasticity of the actor.”<sup>200</sup> To avoid the irreconcilable conflict between the painted scenery and moving three-dimensionality of the actor, Appia advised the use of “practicables” — three-dimensional plastic volumes — in conjunction with colored and moving light that “enfolds the actors and is not imaginary.”<sup>201</sup> While practicables were not new to theater, and had been a standard element within nineteenth-century stagecraft, they had been used in the service of “realistic illusion” and the creation of a representational scenic environment. Instead Appia called for the use of simple, unadorned practicables and sophisticated mobile and atmospheric lighting techniques. The design, type and direction of the light was what activated and modeled the practicables and provided the living setting which the actor inhabited. Describing the types or forms of lighting one might use in designing a scene, Appia identified three principle types of light: 1) diffuse light or *Helligkeit*, which provided general scenic light, 2) active light or *gestaltendes Licht*, which produced light and shade, and 3) painted or illusory light, as used within traditional scenic backdrops. The third type, painted or illusory light, was entirely unacceptable in Appia’s vision of modern theater, and he called for its immediate eradication.

His keen interest in the use of light to create a new and abstract scenic environment developed in part from his desire both to move away from the techniques of nineteenth-

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<sup>199</sup> On the influence of Appia’s work in the U.S., see Lee Simonson, “Forward,” in *Music and the Art of the Theater*, ed., Barnard Hewitt (Coral Gables, FL: University of Miami Press, 1969), xi.

<sup>200</sup> As quoted in Bergman, 323.

<sup>201</sup> As quoted in Bergman, 324.

century naturalist theater and to realize the full potential of Wagnerian opera with what he called “visual music” (something he believed Wagner never himself achieved).<sup>202</sup> Describing the close relationship between music and light, and sound and vision, Appia used a functional metaphor, writing:

Light is to production what music is to the score: the expressive element as opposed to external signs; and as is the case of music, light can express only that which belongs to the ‘inner essence’ of all vision...The two elements have an analogous existence. Each of them needs some external object if their activity is to be put into effect: the poet, in the case of music, and the actor (by means of spatial layout) for lighting.<sup>203</sup>

Appia proposed that light alone had the capacity to unify both static and mobile three-dimensional forms within the scenic environment, and furthermore, to evoke an emotional and spiritual dramatic experience not only like, but equivalent to that of music. He wrote, “As music releases the mood of a scene, projecting the deepest emotional meaning of an event as well as its apparent action, so the fluctuating intensities of light can transfigure an object and clothe it with all its emotional implications.”<sup>204</sup>

While the use of lighting in scenic design to establish mood and other emotive conditions traces back to at least the sixteenth century and the stagecraft techniques introduced in Italian and English Renaissance theater, Appia’s contribution is significant in terms of setting out a comprehensive theory of stage lighting as the primary medium in the communication of the dramatic composition.<sup>205</sup> He distinguished between the characteristics and purposes of diffuse light (*Helligkeit*), which he argued made things visible but which did not impart emotion or psychic intention, and form-giving, “active” light (*gestaltendes Licht*), which provided light and shadow, modeling a living entity. Importantly, it was the nature of

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<sup>202</sup> Bergman, 325.

<sup>203</sup> Beecham, *Adolphe Appia: Texts on Theater*, 51.

<sup>204</sup> Lee Simonson, “The Ideas of Adolphe Appia,” in *The Theory of the Modern Stage*, ed., Eric Bentley (London: Penguin, 2008), 35.

<sup>205</sup> The most comprehensive reference to date on the role of lighting in the history of Western stagecraft remains, Gösta M. Bergman, *Lighting in the Theater* (Almqvist & Wiksell International, Stockholm, Sweden, 1977).

shadow cast by the combination of *gestaltendes Licht* and *Helligkeit* that held the greatest narrative ability. As he described, it was the intensity of the cast shadows produced by the combination of the *gestaltendes Licht* and *Helligkeit* that communicated the “character of the lighting.” Without the combination of all three elements—diffuse light, active light, and shadow—the character of light remained indeterminate and the full expressive potential of the dramatic production was lost.<sup>206</sup>

While there were many real obstacles limiting the realization of his theories, Appia remained optimistic about the potential of artificial lighting for the modern theater arts, writing,

Light is the most important plastic medium on the stage...Without its unifying power our eyes would be able to perceive what objects were but not what they expressed...What can give us this sublime unity which is capable of uplifting us? Light!...Light and light alone, quite apart from its subsidiary importance in lighting a dark stage, has the greatest plastic power, for it is subject to a minimum of conventions and so is enabled to reveal vividly in its most expressive form the eternally fluctuating appearance of a phenomenal world.<sup>207</sup>

In his theoretical works, Appia described an entirely new approach to scenic lighting, replacing traditional footlights, wing and border lights with a centrally controlled, holistic system able to accommodate mobile and static lighting. While the technology of electric lighting was not advanced sufficiently to realize his proposals in the earlier years of his career, the next generation of scenic designers, equipped with a much greater range of lighting equipment and controls were able to more fully explore the potential of his theories.

### **Edward Gordon Craig: “Beyond Reality”**

Craig, whose ideas arguably were best known among those involved in the new stagecraft movement in the USA, also developed a number of techniques aimed at achieving a stylized

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<sup>206</sup> Beecham, *Adolphe Appia: Texts on Theater*, 51.

<sup>207</sup> Simonson, “The Ideas of Adolphe Appia,” in Bentley, 33-34.

universal condition through abstraction and the removal of descriptive, naturalistic scenographic detail.<sup>208</sup> In his 1911 publication, *On the Art of Theater*, Craig delineated the principles of the new theater, which included stylization, simplification, and abstraction of the actor and scenic elements. Only by stripping away all representational detail, Craig argued, could the dramatic experience be realized through the apperception of the viewer, as opposed to being imposed upon the viewer as a completed work. What Craig sought to gain with this approach was something that transcended traditional dramatic arts, as he described:

Drama, which is not trivial, takes us *beyond reality*...It is in this sense of being beyond reality which permeates all great art. We see it in the little clumsily painted pictures of those periods when the true *beyond* was of more importance than a right perspective, when the perspective of thought and feeling held the first place.<sup>209</sup>

In order to move the dramatic experience “beyond reality” Craig, like Appia, called for a wholesale rejection of painted backdrops and representational stage architecture. Instead he proposed the use of mobile lighting, color and geometric scenic elements. Such a scenic environment, rather than recreating a specific location, time or a scene, could suggest a mood, an atmosphere, or universally understood emotive conditions.

More radical than Appia on a number of issues, Craig criticized the imitation of “natural light” conditions, advocating the use of “frankly non-natural” stage lighting techniques when illuminating the scene.<sup>210</sup> Key to Craig’s notion of the new theater art was the importance of “suggestion” in the dramatic production:

By means of suggestion you may bring on the stage a sense of all things—the rain, the sun, the wind, the snow, the hail, the intense heat—but you will never

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<sup>208</sup> Edward Gordon Craig, *Craig on Theater*, edited by J. Michael Walton (London: Methuen, 1983). On Craig, see, Brian Arnott, *Towards a New Theater: Edward Gordon Craig & Hamlet* (Ottawa: National Gallery of Canada, 1975); Norman Myers, “Early Recognition of Gordon Craig in American Periodicals,” *Educational Theater Journal* vol.22, no.1 (Mar., 1979): 78-86. On the influence and dissemination of Appia’s and Craig’s theories see Bergman, *Lighting in the Theater*, 311-350; Patrick Carnegy, *Wagner and the Theater* (New Haven, Conn.; London: Yale University Press, 2006), 175-205; and Kenneth Macgowan and Robert Edmond Jones, *Continental stagecraft* (Harcourt, Brace, 1922).

<sup>209</sup> Edward Gordon Craig, “A Note on Masks” [1910], as excerpted in Edward Gordon Craig, *Craig on Theater*, edited by J. Michael Walton (London: Methuen, 1983), 18-19.

<sup>210</sup> Edward Gordon Craig, *On the Art of Theater* (Chicago: Browne's Bookstore, 1911), 81-82;

bring them there by attempting to wrestle and close with Nature, in order so that you may seize some of her treasure and lay it before the eyes of the multitude. By means of suggestion in movement may translate all the passions and the thoughts of vast numbers of people...Actuality, accuracy of detail, is useless upon the stage.<sup>211</sup>

The emphasis on movement, rhythm and action characterizes much of Craig's recommendations for the modern art of theater, including that of the lighting for the stage. As early as 1897, Craig described a production that included a curtain-free, mobile proscenium, and a lighting switchboard control room at the rear of the auditorium, from where he could communicate with the stage and direct the lighting.<sup>212</sup> And by 1905, Craig was experimenting broadly with new lighting effects utilizing transparencies, curtains, and projected shadows, colors and patterns, and even a proposed lighting system with lamps accommodating over twenty reflectors to direct beams of light to any area of the stage.<sup>213</sup> In proposing such a diverse array of lighting and scenic effects possible with a minimum of elements, theater historian Gösta Bergman has argued, Craig forged "a new art besides architecture and music, the art of the mobile, cubic shapes and of varying space."<sup>214</sup>

Breaking open the tightly constructed, representational single-perspective space of nineteenth-century theater, electric light facilitated a newfound freedom of expression and mechanisms for communicating coherent, mobile three-dimensionality and dramatic intent.<sup>215</sup> While their theories differed in a number of respects, both Appia and Craig shared a belief in the central role of lighting in defining a new vocabulary for modern scenic design. In their writing and work, as well as that of their contemporaries and successors, a modern theory of light as a medium of design was collectively developed. It is here also that we see the origins

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<sup>211</sup> Craig, *On the Art of Theater*, 26-27.

<sup>212</sup> Bergman, *Lighting in the Theater*, 334.

<sup>213</sup> *Ibid.*, 337.

<sup>214</sup> *Ibid.*, 337.

<sup>215</sup> Craig, "Rearrangements," *Craig on Theater*, 39-41.

of a theory of architectural lighting that would more fully develop in the 1940s and 1950s, in the work of Stanley McCandless and Richard Kelly, as discussed further in Chapter 4.<sup>216</sup>

### Scenography for the Modern Interior

Whether for the stage or the interior, designers sought out the highly mutable and abstract character of electric lighting as a means of achieving new spatial and dramatic effects. Much more than a casual intersection of ideals or practices, there was sustained exchange between stagecraft and interior design in the 1920s and 30s, with a number of prominent designers working simultaneously in both fields. In the USA, designers such as Norman Bel Geddes, Henry Dreyfuss, Frederick Kiesler, and Joseph Urban regularly crossed over between theater and commercial design. Growing interest in understanding and adapting new theater lighting applications and approaches to non-theatrical contexts is suggested by the inclusion of descriptions of stagecraft innovations in American trade journals and popular shelter magazines. For example *Arts & Decoration* reprinted an editorial by Edward Gordon Craig in 1921, noting its “striking and timely interest” and advising readers that the “new art of light” as practiced by Craig was able to transform costumes and scenery “instantaneously.”<sup>217</sup> Setting out his position on the appropriateness of electric lighting for modern theatrical stagecraft, Craig wrote:

My opinion of the whole new system is that it is the only right one for the modern era. I have for quite a long while now said that painting scenes with paint is out of place and out of date in Theaters, and I have for just as long hinted that light should be used, so I am naturally pleased to see it coming along.”<sup>218</sup>

While Craig did not make an explicit connection between the new stagecraft and the lighting of non-theatrical interiors, others would, and certainly the inclusion of Craig’s

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<sup>216</sup> See Chapter 4, “The Science and Art of Lighting,” 253-271.

<sup>217</sup> Edward Gordon Craig, “The New Art of Light,” *Arts & Decoration* vol. 16 (Nov., 1921): 52.

<sup>218</sup> Craig, “The New Art of Light,” 52.

editorial within *Arts & Decoration* sets his theories within the context of new ideas and approaches to the interior. Making this link explicit, the Cheney's described the adaptation of key new stagecraft theories to the design of the modern interior, noting the natural cross over of designers practicing in both areas in *Art and the Machine*:

In lighting machinery and effect, of course, the interior designers are largely adapting the electrical equipment originally devised by artists of the theater, for use in connection with the new stagecraft. There is not a little of the honesty and the beauty of modern stage settings in the new interior architecture, and one recalls that several of the outstanding industrial designers and interior designers have been occasionally identified with stage work.<sup>219</sup>

More general discussion of electric lighting's potential for transforming the modern interior can also be found in popular magazines and professional journals with regularity from the mid-1920s onwards. For example, in 1928 *Arts & Decoration* published a round up of "L'Art Moderne in Lighting," describing the use of electric light in the interior for illumination and decoration. Unusual for new product reviews, rather than focusing on the design of the fixtures, the article focused on the importance of good lighting effects within the modern interior, claiming:

In no other field of interior decoration have more tremendous strides been made than in lighting and lighting equipment. Today we find light used not alone for illumination but for decorative effects. Its possibilities in this field have long been recognized on the stage where lamps are often used in a set to create spots of interest in a carefully composed room."<sup>220</sup>

As the 1920s came to a close, such promises of the potential benefits of modern electric lighting applications in reshaping the modern interior were increasingly matched by warnings of the repercussions if they were not considered in the initial design process.<sup>221</sup> As *Arts &*

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<sup>219</sup> Cheney, *Art and the Machine*, 202.

<sup>220</sup> Mary Barbara Dennis, "'L'Art Moderne' in Lighting," *Arts & Decoration*, Vol. 28 (March, 1928): 74-74.

<sup>221</sup> See for example, Stanley Taylor, "Modern Lighting Methods for the Home," *Arts & Decoration* vol. 27 (Oct. 1927): 84-86; Frances Taylor Heard, "Reflected Light from Hidden Sources," *Home & Field* vol. 44 (Jan. 1934): 36; Helen Thompson, "Light in Modern Dress," *Arts & Decoration* vol. 40 (Feb. 1934): 42-43; "Lighting by Design," *Arts & Decoration* vol. 42 (Nov. 1934): 14-19; Morse Moore, "Make the Most of Your Light," *Arts*

*Decoration* proposed in 1934: “Modern lighting has changed its status. From being the ‘last but not least’ item on the decorative budget, it has become the preface to decoration.”<sup>222</sup> The article continued, criticizing the unwarranted longevity of lighting practices originating in pre-electric applications suggesting, “they persisted alike through periods of elaborate ceremony and through intervals of crude forthrightness. Always, in varying degrees of refinement, a central lighting fixture depended from the ceiling, a pair of brackets adorned each wall, all stalagmited with ineffectual bulbs.”<sup>223</sup> Compounding the difficulty of overcoming such limitations “embedded in the very warp and woof of artificial lighting,” the article stressed widespread concern with ensuring necessary electrical wiring and outlet placement to accommodate appropriate interior lighting, suggesting that Americans had become, “slaves of electric plugs and outlets. If you were a particularly enterprising person, you browbeat your landlord into opening new outlets to match your need for healthful reading as well as for brighter entertainments.” If only convenient, well-planned modern wiring could be assured, then as the *Arts & Decoration* editors advised, outmoded interior lighting could be easily overcome. Modern illumination, *Arts & Decoration* argued, should be approached in the “same way that an architect approaches the mechanics and esthetics of building a skyscraper.”<sup>224</sup> Describing the pleasing effects of an interior properly illuminated, *Arts & Decoration* advised readers that, “The architecture of light will enthrall you as you see beams and pilasters, windows, ceilings, doorways and niches lend themselves to the diffusion of light.”

This “architecture of light” as described by *Arts & Decoration*, was primarily expressed through reflected or indirect light, which the editors praised for its beauty, utility, and modern “scientific” character and controllability. Noting the capacity of electric illumination to

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& *Decoration* vol. 53 (Dec. 1940): 42-43; B.B. Anthony, “Light the Modern Way,” *American Home* vol. 26 (Nov. 1941): 70-71.

<sup>222</sup> “Lighting by Design,” *Arts & Decoration* vol. 42 (Nov. 1934): 14-19.

<sup>223</sup> *Ibid.*, 15.

<sup>224</sup> *Ibid.*, 15.



articulate the various qualities of different surfaces and textures, they recommended employing new indirect lighting applications to enhance the properties of materials characteristic of the machine age aesthetic, including bakelite, lumerith, glass, aluminum, copper, chromium, and stainless steel.<sup>225</sup> In this and similar articles, readers were instructed to think of and employ electric light architecturally *and* decoratively in order to maximize “the utmost possibilities of materials, color, space.”<sup>226</sup>

Another article, “Modernistic into Modern” appeared a few months later in *Arts & Decoration* and similarly identified electric lighting as a key agent in the modernization of contemporary interiors. The article addressed the persistent threat of the *moderne*—the much criticized stylistic legacy of the 1925 Paris world’s fair, the *Exposition internationale des arts décoratifs et industriels modernes*, which by the early 1930s had become closely associated with decorative excess and the more disparaged aspects of popular consumer taste.<sup>227</sup> Detailing designer Robert Heller’s transformation of a “modernistic” apartment into a *modern* interior, the article emphasized the important role that electric lighting and the reduction of decorative elements had played in the renovation:

Mr. Heller achieved his dramatic effect simply by the contrast of light and dark; by the clean lines which he lifted out of the confusion; by lighting that is as decorative as it is efficient. The grotesqueries of lighting flashes, of geometric nightmares, of form climbing onto form, he discarded in favor of simplicity, directness, restraint. Only now we are aware of details, of fine proportions, of the architectural and decorative value of color. Only now do we recognize the kind of emphasis which the architecture of a room may successfully impose on a modern interior.<sup>228</sup>

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<sup>225</sup> Ibid. Throughout the article work by such well-known machine age architects as Ely Jacques Kahn and Paul Wiener as well as industrial designers Kurt Versen and Walter Kantack is used to illustrate the aesthetic harmony possible between architectural lighting and the modern interior.

<sup>226</sup> “Modernistic into Modern,” *Arts & Decoration* vol. 42 (Nov. 1934): 10-12.

<sup>227</sup> In this article “modernistic” design is described as the “product of a nursery—the infant stage of a new school of thought,” and the “modernistic” designer as a “perennial schoolboy, content to repeat his idea as long as he might increase his tempo.” “Modernistic into Modern,” 10-11.

<sup>228</sup> Ibid., 12.

Again here, as in other examples, it can be argued that there is sympathy with new stagecraft theories and applications of electric lighting in the conveyance of three-dimensional form and space. In the debates over the design of the interior, modernists called for the stripping away of ornament, pattern, and figurative decoration—much as it had been in theater stagecraft reform—so that the architecture could be experienced and appreciated as an aesthetic composition unto itself. Carefully planned, architecturally integrated indirect lighting was seen as a way of articulating and enhancing the experience of architecture and therefore, the experience and enjoyment of modern interior.

While such reforms may have been readily embraced in progressive theater communities, convincing Americans to abandon ornament in their interiors was more problematic. However, those most committed to modernism had little patience for noncompliance, and in this context, electric lighting took on newfound importance as a means of creating modern decorative effects within the interior. A 1934 article, “Ornament will be Concentrated” published in *Arts & Decoration* specifically addressed the conundrum of ornament in modern interior decoration. Starting from the premise that “the modern way of unbroken lines and uninterrupted surfaces has sent the old forms of diffused ornament into the satchet,” the article suggested that rather than disappearing entirely, ornament instead had become “concentrated,” “strengthened rather than eliminated.”<sup>229</sup> According to *Arts & Decoration*, modernism was driving ornament “into the great open spaces,” requiring that it be placed “with the same precision as sources of light.”<sup>230</sup> More than just being similar in its precise selection and placement, lighting also provided a means of visually enhancing and modulating unadorned surfaces and modern materials. *Arts & Decoration* called attention to this important shift in the perception and application of electric lighting in the interior:

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<sup>229</sup> “Ornament will be Concentrated,” *Arts & Decoration* vol. 40 (Jan., 1934): 6-15.

<sup>230</sup> *Ibid.*, 8.

Up to date the decorative emphasis in a room has been confused by lighting fixtures. Side brackets and chandeliers and table lamps, all gaily lighted, are confusing. However, today that confusion is disappearing. With modern electrical science, the use of reflectors, the control of light rays, the strength we were once able to get from five fixtures is now concentrated into one. And the fixture can be simpler, if we wish it to be. Or more beautiful, if we wish to count it in our ornament rations—as a high point of beauty.<sup>231</sup>

Indeed, it is in this last respect that the electric lighting fixture would remain a specialized decorative component of the modern interior.

An educated voice on the integration of fixture design and electric lighting effects in the 1920s and 1930s, the New York-based designer Walter W. Kantack actively contributed to this discourse, yet refrained from the moralizing tendencies of many modernists.<sup>232</sup> Kantack's theories regarding the appropriate use of historic precedents and lighting media were disseminated in part through his self-published journal *Kaleidoscope* (1928-1932), which featured many articles advising readers on the use and design of electric lighting and fixtures. Reaching a broader and more diverse public, Kantack also lectured regularly and published in popular trade journals on the topic of electric lighting and fixture design in this period. Prominent within his writing was the criticism of designers who failed to recognize or take full advantage of the particular properties of electric light, as compared with other luminous media. Kantack repeatedly stressed the superior controllability of electric light, suggesting that, "Through an increased understanding of our lighting medium and its various uses and abuses there are coming forth objects of beauty and practicability wherein the light is controlled and directed with what practically amounts to mathematical accuracy."<sup>233</sup> To achieve such an exact science of light Kantack advised those thinking of building a new home or renovating an interior to first address a number of key priorities, without which good electric lighting would not be possible. Predictably, the first was consideration of interior

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<sup>231</sup> Ibid., 13.

<sup>232</sup> See Wilson, "The Avant-Garde and the Conservative in Lighting Design."

<sup>233</sup> Walter W. Kantack, "A Study of Fine Lighting Today," *Art & Decoration* vol. 35, no. 4 (Aug., 1931): 48-49, 62.

wiring to ensure appropriate distribution of and access to electric power. Next was close consideration of the type or method of illumination necessary to produce the “desired result within the various rooms,” followed by the determination of switching and controls. Then and only then, Kantack suggested, should the decorative or ornamental style of the lighting fixture be considered.<sup>234</sup> The quality of the science and planning of light was most important to Kantack. The decorative features of the fixture were only important in terms of maintaining consistency or correspondence of the period illumination quality and style with that of the interior. He argued that,

...if one is endeavoring to create the atmosphere and decorative characteristics of a period several centuries old, it would seem right to at least take into consideration the capacity of the lighting media of the time, even if one did not actually employ the primitive source of illumination.<sup>235</sup>

Glaringly bright electric bulbs did not belong in “enclosures designed for the shielding of the flame of a single candle.” Modern lighting fixtures made of modern materials and following the principles of modern design did not present for Kantack a singularly appropriate path forward, but rather another style—albeit one well suited to the properties of electric illumination. He suggested that such designs “may be properly termed *electric* lighting fixtures,” carefully distinguishing between historically inspired lighting fixtures designed for electricity from lighting fixtures designed specifically as instruments for electric light.<sup>236</sup>

Outlining a basic framework for understanding and categorizing potential illumination effects, Kantack identified four principle methods of distributing electric lighting in a given space: “direct lighting, indirect lighting, combined direct and indirect lighting and, what may be termed—*directed* indirect lighting.”<sup>237</sup> These illumination techniques he suggested, could “be used and expressed in a variety of forms and combinations that are applicable as lighting

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<sup>234</sup> Kantack, “A Study of Fine Lighting,” 48-49, 62.

<sup>235</sup> *Ibid.*, 49.

<sup>236</sup> *Ibid.*, 49, 62.

<sup>237</sup> Walter Kantack, “Fundamentals in Providing for Good Lighting,” *The American Architect* 140 (September, 1931): 48-51, 120, 124.

principles on ceiling, wall, table, or floor.”<sup>238</sup> His approach placed light quality and effect first, collapsing the distinction between fixtures and architectural lighting.

Kantack illustrated each of these four lighting effects in an article for *The American Architect* in 1931 with photographs of various fixtures he had designed in widely ranging styles. Despite employing a variety of ornamental styles, the fixtures were able to provide the basic luminous effects described in his text. The greatest range of lighting effects complementary to architecture, he proposed, were afforded by the fixtures producing “indirect-direct” and “*directed* indirect lighting”—which took advantage of the decorative shielding included in the design of the fixture to hide high intensity lamps from direct view, while also channeling the light from the lamps towards wall, ceiling, or mouldings as desired. Offering a variety of decorative fixtures able to produce a specialized range of lighting effects, Kantack demonstrated the importance of considering the lighting effect before the design of the fixture—as well as the relative independence of these considerations. Regardless of aesthetic styling, Kantack’s ensured his lighting fixtures delivered modern lighting effects that emphasized the architectural features, spatial arrangements, and stylistic character of the interior.

Whether for the stage or residential interiors, electric light was closely linked with efforts to move away from ornamental or representational design elements in pursuit of greater abstraction and clarity in the composition and communication of modern spatial and architectural qualities. Across a broad group of advocates, electric light became both a symbol and constituent characteristic of a new, modern aesthetic. Precise and predicable in its control and effect, for many electric light represented the synthesis of modern art, science and engineering. Such beliefs cut across disciplines and were transmitted much like light

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<sup>238</sup> Ibid., 51.

itself, from source to surface, reflecting and transmitting the properties of the surrounding context.

### **Barr and Johnson: Modernism in the USA**

As has been discussed above, interest in defining principles and terms of creative practice in keeping with the modern age and modern sensibilities can be found in a wide range of disciplines during the interwar years—from theater, to the fine and applied arts, to architecture and design. Those disciplines most invested in the visual arts and the portrayal or composition of three-dimensional objects and space, not surprisingly, were the first to adopt and explore the potential of electric light as a medium of modern expression. Critics like Sheldon Cheney importantly provided cross-pollination between individuals and disciplines invested in defining American modernism. While the historical record has not been generous to Cheney, others have received more than their share, perhaps none more than Philip Johnson.<sup>239</sup> But history, like most things, is not fair and tends to be populated by those with a keen sensitivity to its mechanisms and vagaries, and in this respect Johnson most certainly earned his due. Yet despite the volume of scholarship on Johnson's work and writing, very little attention has been given to his contributions to the development of architectural lighting design in the USA, or even more generally, to his life-long interest in exploring the aesthetic potential of electric light.<sup>240</sup> While it is difficult to trace the exact origins of his sustained engagement with lighting design, certainly his voracious appetite for modernism and his engagement with the avant-garde in Europe and America in the interwar years would have

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<sup>239</sup> Despite Cheney's popularity and influence for much of his career, he has received scant attention from historians. Platt argues that his near omission from the scholar record is in fact a direct result of his popular appeal. See Platt, 11-12.

<sup>240</sup> On Johnson's explorations of residential architectural lighting see Margaret Maile Petty, "Edge of Danger: Electric Light and the Negotiation of Public and Private Domestic Space in Philip Johnson's Glass and Guest House," *Interiors* 1:3 (Fall 2010): 197-218.

brought him into contact with any number of artists and designers whose works suggested the potential role of electric light in forging new, modern modes of expression.

While Cheney was writing on the new stagecraft and modern art in the late 1920s, Johnson was studying philosophy at Harvard, where he also met Alfred H. Barr, Jr, who had been asked to help found the Museum of Modern Art (MoMA) in New York City in 1928. Appointed as the first director of MoMA the following year, Barr invited Johnson to assist him in developing a department of Architecture and Design. In preparation for this task, Johnson traveled to Europe, meeting up with the American architectural critic and historian Henry-Russell Hitchcock to survey a wide array of modern art and architecture so that they might publish a book summarizing their findings.<sup>241</sup>

Returning to the United States from his travels, Johnson completed his degree at Harvard in 1930, and officially joined Barr at MoMA in 1932 as head of the Department of Architecture.<sup>242</sup> His inaugural project—a collaboration with Hitchcock and Barr—was the highly influential exhibition “Modern Architecture: International Style,” which presented a critical and visual summation of contemporary work (much taken from their European travels) that they felt epitomized the highest achievements of modern architecture. The publication accompanying the exhibition *The International Style: Architecture since 1922*, sought to define a cohesive “style” drawing upon elements from the work of a number of prominent modernist European architects, including Le Corbusier, Ludwig Mies van der Rohe, J.J.P. Oud, Walter Gropius, and others.<sup>243</sup> Barr provided the preface for the book, in

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<sup>241</sup> See Franz Schulze, *Philip Johnson: Life and Work* (Chicago: University of Chicago Press, 1994); however valuable and more informal remarks can be found in Hilary Lewis and John O’Conner, *Philip Johnson: The Architect in his own Words* (New York: Rizzoli, 1994).

<sup>242</sup> Sybil Gordon Kantor, *Alfred H. Barr, Jr., and the Intellectual Origins of the Museum of Modern Art* (Cambridge, MA: MIT Press, 2002).

<sup>243</sup> Henry-Russell Hitchcock and Philip Johnson, *The International Style: Architecture Since 1922* (New York: W.W. Norton & Co., 1932). See also Henry Matthews, “The Promotion of Modern Architecture by the Museum of Modern Art in the 1930s,” *Journal of Design History*, v.7 (1994): 43-59.

which he set out the guiding principles of this new modern ‘style’, the most important of which were:

Emphasis upon volume—space enclosed by thin planes or surfaces as opposed to the suggestion of mass and solidity; regularity as opposed to symmetry or other kinds of obvious balance; and, lastly, dependence upon the intrinsic elegance of materials, technical perfection, and fine proportions, as opposed to applied ornament.<sup>244</sup>

Although Barr made no explicit reference to electric light or illumination, its role was tacit in the successful realization of these principles, most critically in the articulation of architectural volume and emphasizing the “intrinsic elegance of materials.” With *The International Style*, Barr, Hitchcock and Johnson established as near a canon for modern architecture as the United States would ever have. Therefore, it is valuable to understand the relationship of its guiding principles to the ideas and theories upon which the International style was based, the creative paths which its authors crossed, and moreover, the opportunities it enabled for greater exploration of the architectural potential of electric light. However, these threads are most readily untangled and understood not by closer examination of the International Style exhibition or publication, but rather by exploring the less well-known Johnson and Barr collaboration for MoMA—the 1934 “Machine Art” exhibition.<sup>245</sup>

Only two years after their successful International Style exhibition, Johnson and Barr applied a similar survey method to define a machine age aesthetic based upon the logic and inherent properties of industrial manufacture and reconciling beauty and aesthetic experience with machine made objects. Much like their contemporaries similarly engaged with the modern visual arts, Barr and Johnson argued that the pure expression of form and surface characteristic of machine made objects resulted in an abstract beauty that could be

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<sup>244</sup> Alfred H. Barr Jr, in Hitchcock and Johnson, *The International Style*, 13.

<sup>245</sup> On Barr and Johnson’s collaborations on behalf of building an audience for modernism at MoMA see David A. Hanks, ed., *Partners in Design: Alfred H. Barr Jr. and Philip Johnson* (The Monacelli Press, 2015); on Barr and Johnson and the Machine Art exhibition, see Jennifer Jane Marshall, *Machine Art, 1934* (University of Chicago Press, 2012).



appreciated in and of itself, without knowledge of the function or use of the object. Casting such machine made objects as platonic incarnations, they prefaced their exhibition with the suggestion that with “the perfection of modern materials and the precision of modern instruments, the modern machine-made object approaches far more closely and more frequently those pure shapes the contemplation of which Plato calls the first of the ‘pure pleasures.’”<sup>246</sup>

### **Machine Art: The Abstract Beauty of Surfaces and Solids**

As with the International Style exhibition, Johnson relied heavily on European precedents in his description of the evolution and maturing of the principles of machine art. In his essay on the history of machine art prefacing the catalogue, Johnson gave the highest praise to Germany, where he argued, the “post-war generation prided itself on achieving a mechanistic age and on designing proper utensils for living in it.” Within this group the Bauhaus School at Weimar was held up as exemplary of the development of new expressions of “machine-like simplicity.”<sup>247</sup> Barr and Johnson’s knowledgeable admiration of the interwar modern movement in Europe underscores their framing of the potential flourishing of art and design in the United States, as well as their suggestions regarding how modernism might be better nurtured domestically. While many among the European avant-garde, such as Erich Mendelsohn, Bruno Taut, Walter Gropius, and Le Corbusier, had referenced American industrial architecture and industrially manufactured objects as examples of modern, functional design, Barr and Johnson—Johnson in particular—had little positive to say about

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<sup>246</sup> Alfred H. Barr, Jr., “Forward,” *Machine Art* (New York: Distributed by H.N. Abrams, Museum of Modern Art, 1994 [Sixtieth-Anniversary ed.]), not paginated.

<sup>247</sup> Philip Johnson, “History of Machine Art,” in *Machine Art* (New York: Distributed by H.N. Abrams, Museum of Modern Art, 1994 [Sixtieth-Anniversary ed.]), not paginated.

the development of industrial design or the applied arts in the United States.<sup>248</sup> Rather Johnson argued that the American minor arts had “suffered from imitation of second-hand European designs,” conceding in passing however, that “the tradition of machine construction has been purer and stronger” in the United States.<sup>249</sup>

The exhibition catalogue also included an introduction by Barr, in which he set out a theoretical framework for understanding and appreciating the beauty of machine-made objects *as art*. Describing his views in relation to the objects on display, which ranged from very large industrial goods such as an outboard propeller to very small items, like self-aligning ball bearings, to everything in between, including pots and pans, a toaster, a cash register, and chemistry beakers, Barr offered a provocation for American industry and consumers. Repurposing the words of the English philosopher L. P. Jacks, Barr proposed that if “we are to ‘end the divorce’ between our industry and our culture we must assimilate the machine aesthetically as well as economically. Not only must we bind Frankenstein—but we must make him beautiful.”<sup>250</sup>

However it was up to Johnson, who curated and designed the exhibition, to embody and express Barr’s rhetoric through the display of a vast array of industrial products. To sell everyday objects of industrial design and manufacture to the American public as art required both savvy and finesse—which fortunately were among Johnson’s strengths. Employing the very materials and technologies of industry to glamorize the largely quotidian objects on display, Johnson utilized a machine art vernacular to provide a unified and harmonious context for the exhibition. Electric lighting, while not on display as such, nonetheless played

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<sup>248</sup> On the role of the American industrial vernacular in European formulations of modern architecture, see Reyner Banham, *A Concrete Atlantis: United States Industrial Building and European Modern Architecture, 1900-1925* (Cambridge, Mass.: MIT Press, 1986).

<sup>249</sup> Johnson, “History of Machine Art”.

<sup>250</sup> Barr, Jr., “Forward,” *Machine Art*. Jewell likewise pulls this quote and the context for its application to the consideration of American industrial design from Barr, Jr.’s to summarize his review of the paired 1934 exhibitions on industrial art. Jewell, “Art Scans its Niche in Industrial Plan,” 22. On Jack’s views regarding the threat of mechanism to humankind, see (for example) “Mechanism, Diabolism and the War,” *The Hibbert Journal*, v. 13 (October 1914 -July 1915), accessed <https://archive.org/stream/hibbertjournal13londonoft#page/28/mode/2up>.

a key role in Johnson's exhibition design, providing a visual condition suitable for the synthesis of beauty and utility promised in the exhibition catalogue. Barr and Johnson's emphasis on the unmediated appreciation of *beauty* in the machine-made artifact, one might argue, distinguished the American context for modernism from that of its European counterparts—where utility and fitness for purpose were most highly valued, with beauty resulting from the compatibility of these two aspects, where as in the United States beauty or aesthetic pleasure was set aside from or above functionalism. As Barr suggested,

In a great many useful objects function does not *dictate* form, it merely indicates form in a general way. The role of the artist in machine art is to choose, from a variety of possible forms each of which may be functionally adequate, that one form which is aesthetically most satisfactory. He does not embellish or elaborate, but refines, simplifies, and perfects.<sup>251</sup>

Consciously, Barr gave full-creative agency to the designer, reducing the machine from producer of beauty to conduit for aesthetic experience. The parsing out of beauty from utility—if still kept in close proximity—characterized Barr and Johnson's definition of Machine Art as well. The elevation of beauty and sensual enjoyment would extend beyond Barr and Johnson's efforts, providing a foundation for the postwar emphasis on lifestyle and personal pleasure and satisfaction as realized through consumer culture and practices—a hallmark of American mid-century modernism.

Calling upon the very foundations of Western philosophy, Barr framed his introductory comments in reference to a quote from Plato's *Philebus*, which opened the catalogue. In this passage, the philosopher described the “beauty of shapes” as non-representational and comprised of pure geometries made possible only through the tools of measurement and engineered exactitude.<sup>252</sup> Refining this notion, such to more closely speak to the machine-made objects on display, Barr suggested, “The beauty of machine art is in part the abstract

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<sup>251</sup> Barr, Jr., “Forward,” *Machine Art*.

<sup>252</sup> As translated by Johnson in the opening pages of the catalogue, Plato writes, “These are not, like other things, beautiful relatively, but always and absolutely.” Philip Johnson, “History of Machine Art,” *Machine Art*.

beauty of ‘straight lines and circles’ made into tangible ‘surfaces and solids’ by means of tools, ‘lathes and rulers and squares.’”<sup>253</sup> Continuing with his platonic alignment of machine art, Barr wrote, “Machines are, visually speaking, a practical application of geometry. Forces which act in straight lines are changed in direction and degree by machines which are themselves formed of straight lines and curves.” Here again Barr conflated machine and machine-made object within the same aesthetic continuum. While such a neoplatonic framework suited Barr and Johnson’s desire to create an ideological foundation for modern industrial design, the weight of Plato’s argument was somewhat out of scale with the reality of toasters, kitchen pots and cash registers. The seemingly impossible disconnect between Barr’s rhetorical posturing and the commercial context of the majority of the objects exhibited was most convincingly reconciled through Johnson’s display design—although many would remain unconvinced.

The ideological and cultural tensions inherent in the Machine Art exhibition were noted by a number of reviewers who suggested that Johnson’s installation had more in common with a department store showroom than a contemporary art exhibition.<sup>254</sup> But while the overtly commercial nature of the show and the objects on display received sharp criticism, Johnson’s exhibition design was widely praised. *New York Times* critic Walter Rendell Storey for example wrote, “The beauty of some of the raw products of industry has been effectively brought out by methods of display. Articles are shown on tables of grained woods, or on black velvet, or against walls of sheet copper, shining steel, molded plastic material or painted surfaces.”<sup>255</sup> In selecting the materials, textures, and colors to serve as a backdrop for the objects on display, Johnson also considered their appearance under different kinds of

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<sup>253</sup> Alfred H. Barr, Jr., “Forward,” *Machine Art: March 6 to April 30, 1934*, Sixtieth-Anniversary ed. (New York: Museum of Modern Art; H.N. Abrams, 1994).

<sup>254</sup> A critic from *The New Yorker* described with some irony, “The place itself looks, more than anything else, like a very elaborate hardware store.” Appearing in Talk of the Town, “Machine Art,” *The New Yorker*, March 17, 1934, 18.

<sup>255</sup> Walter Rendell Storey, “Machine Art Enters the Museum Stage,” *New York Times*, Mar. 4, 1934, SM12.

electric light, utilizing a variety of indirect and direct lighting applications to emphasize and dramatize the character of the displayed artifacts.

Remarked upon in a number of reviews of the exhibition, Johnson's skillful use of electric lighting created a range of distinct visual settings, accentuating individual material characteristics, surface qualities, and forms, as well as providing visual clues suggesting traditional cultural associations with precious objects. For example Johnson darkened a small square gallery and placed in its center a table covered with black velvet upon which he arranged glass beakers and dishes in tightly composed rows. Bright spotlights hovering just above the tops of the beakers, made the glass objects appear to glow from within. The intensity of the lighting on the glass objects against the black velvet enhanced both their transparent and specular qualities. The contrast between the darkened space and the bright, sparkling quality of the illuminated glass objects transformed the otherwise modest gallery space into a dramatic interior reminiscent of a high-end retail salon. Johnson miniaturized this effect in another gallery dubbed the "jewel room"—so named for a small show window recessed in the wall, lined with blue velvet and displaying a sparkling group of top-lit screws.<sup>256</sup>

However, the luminous ceiling employed in the main galleries—that is, a dropped false ceiling that allows for the hiding of lamps that illuminate the whole of the ceiling surface from above as a unified plane—received the most attention in the press. Johnson's astute use of this technique filled the large gallery spaces with soft, diffused light, while avoiding the visual distraction or physical interruption of ceiling or wall-mounted lighting fixtures, further accentuating the juxtaposition of the bright open spatial volume of the main gallery with the

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<sup>256</sup> See Mary Anne Staniszewski, *The Power of Display: a History of Exhibition Installations at the Museum of Modern Art* (Cambridge, Mass.: MIT Press, 1998), 152-160.

smaller side galleries and the more intimate use of light in these spaces.<sup>257</sup> While Johnson's luminous ceiling was celebrated in the press as a novel invention, it had an established history by the 1930s, including a number of well-known European precedents that he would have seen or been aware of from his previous travels.<sup>258</sup> His particular iteration of the luminous ceiling was most closely aligned with Appia's own explorations of "diffuse light" in 1911-12 in the *Festspielhaus* designed for the German garden city of Hellerau, near Dresden. Here he created an entirely luminous volume, with back lit walls and ceiling as a means of crafting a seamless and unified context for dramatic performance and experience. Similarly, Johnson's luminous ceiling electric light created a visually unified and harmonious space for the display of a very disharmonious collection of objects. In addition to the luminous ceiling, Johnson used a variety of other electric lighting applications, dramatically enhancing the qualities of the materials used in the installation as well as the unadorned surfaces and smooth edges of the modern industrial products on display in the show.

The importance of maximizing the full aesthetic potential of the machined materials and surfaces has been underappreciated in historical analysis of the Machine Art exhibition and of design from this period more generally. This may be due in part because such a focus counters the long-prevailing interest in form, utility, and the anti-decorative rhetoric of modernism. However, returning to Barr's own framing of Machine Art exhibition, he foregrounded surface as an, if not *the*, essential quality of industrial, machine age art. He wrote, "Beauty of surface is an important aesthetic quality of machine art at its best.

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<sup>257</sup> A critic for *The Christian Science Monitor* praised the effect writing, "False ceilings of muslin diffuse the lighting and give intimacy to the display." See E. C. Sherburne, "Even the Kitchen Sink," *The Christian Science Monitor*, Mar. 10, 1934, 10.

<sup>258</sup> Including the luminous ceiling in Hellerau's *Festspielhaus* near Dresden designed by Appia and the architect Heinrich Tessenow in 1911-12, Mies van der Rohe and Lilly Reich's luminous ceiling for their *Glasraum* installation in the 1927 Stuttgart Werkbund "*Die Wohnung*" exhibition, and El's Lissitzky *Abstract Cabinet* of 1927-28 for the Landesmuseum in Hanover. See Marco DeMichelis, "Modernity and Reform: Heinrich Tessenow and the Institut Dalcroze at Hellerau," *Perspecta* 26 (1990): 143-70, 161; Lutz Robbers, "Modern Architecture in the Age of Cinema: Mies van der Rohe and the Moving Image," PhD diss., Princeton University, 2012; and Margarita Typitsyn, *El Lissitzky: Beyond the Abstract Cabinet: Photography, Design, Collaboration* (New Haven: Yale University Press, 1999).

Perfection of surface is, of course made possible by the refinement of modern materials and the precision of machine manufacture.”<sup>259</sup> As the perfection of the machine and the methods of industrial production were best communicated through the engineered regularity and precision of surfaces, Barr insisted that machine art should be devoid of “surface ornament” and that designers should instead call upon the “sensuous beauty” of the material qualities themselves.<sup>260</sup> The visually pleasing nature of modern industrial design according to Barr, stemmed from the platonic, timeless beauty of the inherent qualities of the material (surface). Given electric lighting’s capacity to activate, enhance, or minimize the visual appearance and performance of surfaces, it was indeed a tool well suited to such aims.

### **Beauty and Sales Value: Consumer Modernism**

Returning to the larger historical context of Barr and Johnson’s Machine Art exhibition, and in particular the cultural and financial crisis of the Depression, it is evident that much more was at stake than defining the properties of a new, modern machine art. Underlying the cultural elevation of industrial design and industrially manufactured objects in the show was their commodification and presentation as goods available for purchase. With the exhibition design of Machine Art, Johnson leveraged the “sensuous” surface and material qualities of the objects on display, enhancing the beauty of their intrinsic characteristics, and presumably, fueling consumer desire for these industrially manufactured products by upgrading their cultural status. In addition to putting forward a theoretical justification for machine art, the catalogue also included such helpful information as the name, manufacturer, designer, and price for each object on display. In the instance that an exhibition goer needed further assistance acquiring any of the objects on display, the catalogue helpfully advised: “unless otherwise specified the object may be purchased from the manufacturer.”

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<sup>259</sup> Barr, Jr., “Forward,” *Machine Art*.

<sup>260</sup> *Ibid.*

More than an audacious attempt to single-handedly codify yet another modern idiom in the products of industry, the Machine Art exhibition offered a reconfiguration and synthesis of a number of ideological tenets and visual and spatial strategies primarily originating in the European avant-garde within a distinctly American ethos, whether or not this was explicitly stated by Barr or Johnson. Divorced from any deep social or political context, the Machine Art exhibition celebrated and legitimized the aesthetic enjoyment of industrial products above and beyond any other concerns.<sup>261</sup>

While Barr and Johnson set out to elevate machine-made objects by situating them as exemplars of modern beauty and aesthetic refinement, the press and a number of popular critics were quick to align Machine Art with the aim of defining an appropriate and commercially viable modern style for American industry. *New York Times* art critic Edward Alden Jewell for example suggested that the seeds of a “national style” could be identified in the products of American industry. This assertion appeared in Jewell’s review of two machine age exhibitions—Barr and Johnson’s Machine Art at MoMA and the National Alliance of Art and Industry’s Industrial Arts Exposition.<sup>262</sup> Critiquing the two contemporary exhibitions, Jewell emphasized the usefulness of both shows in pointing the direction to a new, modern style—one particularly well suited to the qualities of American commercial and industrial design. Jewell recounted the stated objectives of the Industrial Arts Exposition: “To create in commerce and industry the realization of the importance of design; to demonstrate that beauty and sales value are complementary to our civilization; [and] to emphasize visually that there is a definite trend toward a national style.”<sup>263</sup> Such attitudes read against the backdrop of the Depression that held the nation in its grip throughout the 1930s underscore the sense of urgency to speed the growth of United States industries and domestic

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<sup>261</sup> In the forward to the exhibition catalogue Barr wrote, “Fortunately the functional beauty of most of the objects is not obscure and in any case, so far as this exhibition is concerned, appreciation of their beauty in the platonic sense is more important.” Barr, *Machine Art*.

<sup>262</sup> Edward Alden Jewell, “Art Scans its Niche in Industrial Plan,” *New York Times*, Feb. 26, 1934, 22.

<sup>263</sup> Jewell, “Art Scans its Niche in Industrial Plan,” 22.



consumption. While Barr and Johnson maintained an ideological stance and level of rhetoric well above such market-minded arguments such as that put forward by Alon Bement, director of the National Alliance of Art and Industry and curator of the Industrial Arts exhibition, it is impossible to isolate either show from the growing strength and dominance of American consumer culture. That Bement would readily align beauty with “sales value” in his rationale for the importance of design to American industry, suggests the perfect symmetry of these two characteristics for many in the United States. On this point, historian Nicholas P. Maffei has argued that the discourse addressing design and industry in the 1930s commonly posited that modern design methods and aesthetics had the capacity to “streamline consumption, wed beauty to industry and reverse the country’s financial and societal woes.”<sup>264</sup> Similarly, curator and historian Richard Guy Wilson has suggested that, “the issue of ‘sales’ or ‘appeal to the purchaser’ was frequently the underlying motive, sometimes openly acknowledged, other times hidden” in machine age rhetoric.<sup>265</sup> Thus, while artfully exhibited in high profile cultural institutions like MoMA, machine art and the products of American industry were never far in the public imagination from the market place.

## **Chapter 2: Conclusion**

In terms of experimentation, innovation and popularization of new electric lighting technologies and applications in the USA, few if any periods in the history of electrification can match the 1920s and 30s. There were multiple factors contributing to the growing prominence of electric light in many arenas during this period, from the influence of modernism and the introduction of new architectural forms, materials, and principles, to the exploration of new modes and forms of aesthetic expression in the creative arts, greatly aided

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<sup>264</sup> Nicholas P. Maffei, “Both Natural and Mechanical: the Streamlined Designs of Norman Bel Geddes,” *The Journal of Transport History* vol. 30, no.2 (Dec. 2009): 141-167, quote on 141.

<sup>265</sup> Wilson, *The Machine Age*, 43.

by cross over between disciplines by key individuals, and to the increasing demands of a consumer-centric culture. This list however, omits one of the most influential factors—continuous pressure from the United States electric industry to sell ever-greater amounts of electricity and electric light, a main subject of focus in the following chapter.

From the early 1910s and well into the 1920s, electric lighting fixtures and applications were rapidly adapted from single-point sources of light to calibrated devices for the projection, reflection and diffusion of illumination. While initial experimentation pursued by individuals like Luckiesh at G.E. or the independent manufacturer Kantack focused on resolving the dissonance between historical fixture forms and the intrinsic properties of electric light, modernist reform efforts focused on eliminating such historic and ornamental indulgences. Conveniently perhaps, electric lighting was well suited to both the ideology and aesthetics of modernism, in all its variations. In modernist rhetoric and practice, electric lighting was largely transformed from a functional utility of visual acuity to a conduit for *effect*—emotive, atmospheric, architectural, and spatial. A casualty of this transformation, the lighting fixture as a decorative object was shunned, and the lighting apparatus, as much as possible, was to be minimized, or better yet, architecturally integrated to render the source invisible. As deployed by modern artists, architects, and designers, electric light served to enhance the aesthetic appreciation of the intrinsic characteristics of materials (what Barr described as “sensuous beauty”), to articulate new spatial and perceptual conditions, and to realize an unmediated mode of creative communication and expression.

In these ways, electric light played a central role in the aestheticization of the built environment as well as in the renegotiation of the relationship between actor and audience, or object and subject, in the United States during the interwar period. Experimentation with modern electric lighting effects across a diversity of contexts is indicative of the broad enthusiasm for a particularly stylized visual environment in this period—an enthusiasm that

was fostered in the popular media, as well as in more specialized discourse focused on the development and dissemination of modernism.

In the USA, critics and designers like Barr, Johnson, and the Cheneys, ensured that such avant-garde theories and creative practices were put in front of everyday Americans—who the Cheneys described as “ultimate consumers”. Without doubt, American design reform rhetoric was proudly consumer-oriented and affirming of the nation’s cultural values that tied labor and its wages to social mobility. In the United States during the early decades of the twentieth-century, the philosophy of maximizing worker productivity in exchange for increased wages, as set out by scientific management advocates like Frederick W. Taylor and Henry Ford, resulted in a nation that defined social status in relation to disposable income. As the economic historian Gary Cross has argued, “American society was not based on the myth of fixed stations but rather on the myth of mobility.”<sup>266</sup> In such a context consumer habits and practices contributed significantly to one’s place in American society.

The relationship between American industry and consumer culture was particularly intimate. This factor underscored the celebration of the machine during the 1920s and 30s as a symbol both of modernity and the democratization of abundance, most prominently expressed through the popular discourse of machine art. In the nation’s most distinguished cultural institutions, American industry and commerce featured regularly in narratives of national achievement and cultural production. Barr and Johnson’s Machine Art exhibition exposed visitors to new notions of art, grounded in the aesthetics of industrial production and neo-platonic philosophy. Bridging this vast gap, Johnson’s clever exhibition design and use of a variety of modern electric lighting applications presented the products of industry as examples of the highest aesthetic achievement, regardless of purpose or function. It was no coincidence then that design, technology and commerce came together within the galleries of

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<sup>266</sup> See Cross, 22.

one of the major cultural proponents of modernism in the United States. These three vectors of American modernity informed MoMA's continued efforts to disseminate modernism hand-in-hand with consumer education throughout the 1930s and 40s, as exemplified by the museum's popular "Useful Objects" and "Good Design" exhibitions.<sup>267</sup>

In this way modernism was presented as complementary to American sensibilities, and the rhetoric and strategies of avant-garde art and design were adapted and applied to a variety of popular and consumer contexts, contributing to "a commercial aesthetic of desire and longing."<sup>268</sup> The dominance of this commercial aesthetic within the landscape of American popular culture during the 1920s and 30s should not be understated. As Cross has argued, the hold of consumerism on the American psyche remained unbroken throughout the Depression and World War II:

Even though economic collapse in the 1930s and diversion of commodities to the war effort in the 1940s dramatically reduced personal spending, American business continued to seek new ways and new things to sell consumers. In spite of challenges to the social order, most Americans continued to define themselves and their relationships with others through consumer goods.<sup>269</sup>

As the American consumer marketplace expanded, seeking new areas to develop, products to sell, and consumers to convert, the aesthetic of desire needed constant innovation and amplification. The era's artists, designers, and engineers were quick to appreciate this opportunity, taking up the invisible mechanisms of electric lighting, which offered a nearly infinite palette with which to experiment, explore, and enhance any given space and the objects within it.

In the next two decades the promotion and exploration of new applications of electric light would only intensify, focusing more closely than ever on the domestic

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<sup>267</sup> Margaret Maile Petty, "Commercial Patronage and the Retail Exhibition of Modern Design in the United States, 1930s -1950s," in *Incorporating Culture: Corporate Patronage of Art and Architecture*, eds. Melissa Renn and Monica Jovanovich-Kelley (Routledge: forthcoming, 2017).

<sup>268</sup> Leach, 9.

<sup>269</sup> Cross, *An All Consuming Century*, 67.

environment and the individual consumer. In the 1940s and 50s the electric industry redoubled efforts to expand the consumer market for electric lighting with a multi-pronged approach that called upon long-established cultural beliefs and practices rooted in notions of gender, domesticity, and the American lifestyle. Chapter 3 will explore this shift, tracing the rapid domestication of electric lighting technologies in the hands of the nation's ambitious electric industry.

## CHAPTER 3: GENDERED DISCOURSES AND PRACTICES

### Introduction: American Consumer Culture

The unprecedented blossoming of American consumer culture in the postwar period stemmed not only from the surging of the nation's economy in the years immediately following the end of World War II, but also from the particular economic, political, and social conditions that developed in the United States during the first three decades of the twentieth century.<sup>270</sup> In this period, when the nation's industrial production was being dramatically transformed by a host of new technologies, the expanding distribution and increasing affordability of electricity, faster and more reliable forms of long distance transportation for goods and people, and the application of theories of the scientific management to labor practices all contributed to the rapid growth of the United States as a leading producer economy. Such accelerated development of the nation's industry and economy was also contingent upon the participation and support of American middle class consumers, a fact that was not lost on the nation's political and industrial leaders. Historian of twentieth-century American consumer culture, Lizabeth Cohen has described this period as the "first-wave consumer movement," arguing that "the Progressive Era of the late nineteenth and early twentieth centuries marked a significant shift towards recognizing the centrality of consumers to the nation's economy and polity"—a shift that would be more fully realized in the 1930s and 40s, when the "second-wave consumer movement" gave greater power to American citizens first and

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<sup>270</sup> Strasser, *Satisfaction Guaranteed*, Cohen, *A Consumers' Republic*; Cross, *An All-Consuming Century*. More generally on the history of consumerism and the development of consumer culture in the United States see, Grant McCracken, "Culture and Consumption: a Theoretical Account of the Structure and Movement of the Cultural Meaning of Consumer Goods," *Journal of Consumer Research* (1986): 71-84; Lawrence B. Glickman, ed., *Consumer Society In American History: A Reader* (Cornell University Press, 1999); Richard S. Tedlow, *New and Improved: The Story of Mass Marketing in America* (Harvard Business School Press, 1996); and Lendol Calder, *Financing the American Dream: a Cultural History of Consumer Credit* (Princeton University Press, 2009).

foremost as consumers.<sup>271</sup> This second-wave was in itself greatly encouraged by New Deal policies that recognized the importance of including consumer representatives alongside those from business and labor in developing and defining recovery efforts and policies. In this context, the role of consumers in American society diverged into two primary modes of agency, which Cohen describes as that of “citizen consumers” and “purchaser consumers.”<sup>272</sup> Leveraging their purchasing power for political influence, citizen consumers worked collectively to support efforts aimed at “safeguarding the general good of the nation, in particular for prodding government to protect the rights, safety, and fair treatment of individual consumers.” Purchaser consumers alternatively were defined not by collective action so much as by their collective buying power, and were recognized by government and industry “as contributing to the larger society more by exercising purchasing power than through asserting themselves politically.”<sup>273</sup>

While the severe setbacks of the Great Depression slowed the expansion of the United States economy, it did not lessen (at least in any lasting way) the overriding belief in the power of purchaser consumers to drive both the economy and social recovery.<sup>274</sup> Placing the consumer at the center of the nation’s recovery also suited the aims of the New Deal administration and supporters, preserving the guiding tenets of capitalism while also enhancing the (consuming) public’s sense of contributing to American society and the nation’s economic rejuvenation. As Cohen suggests, “By the end of the depression decade, invoking ‘the consumer’ would become an acceptable way of promoting the public good, of defending the economic rights and needs of ordinary citizens.”<sup>275</sup> Importantly, the increasing social and political agency of the consumer in the United States, and the citizen consumer in

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<sup>271</sup> Cohen, *A Consumers’ Republic*, 20-21.

<sup>272</sup> *Ibid.*, 18-19.

<sup>273</sup> *Ibid.*, 18-19.

<sup>274</sup> Landon Storrs, *Civilizing Capitalism: The National Consumers’ League, Women’s Activism, and Labor Standards in the New Deal Era* (University of North Carolina Press, 2003).

<sup>275</sup> Cohen, *A Consumers’ Republic*, 23.

particular, provided greater opportunities for women to engage in their communities and constituencies, on local and national levels. Consumer education classes for women were introduced in American high schools and universities in the 1930s, which along with existing home economics programs provided women with both the knowledge and authority to take up leadership roles in a host of new organizations focused on promoting and protecting consumer advocacy in the United States.<sup>276</sup>

Supporting such efforts, progressive social reformers in this period called attention to the “needs and troubles” of the American public in relation to consumption, arguing for the necessity of a secure standard of living for all citizens.<sup>277</sup> Thus in the reformulation of the American economy that occurred during the 1930s, the concomitant recalibration of American citizenship was as deeply-wedded to consumer activity, and the seeking of recognition, not for greater political representation of average Americans in the polity, but for assurances from government of a stable standard of living, one indicative of the wealth and abundance of the United States.<sup>278</sup> This was a dramatic shift from nineteenth-century nationalizing rhetoric that emphasized the role of industrial and technological innovation as the engine for the nation’s progress, as discussed in Chapter 1.<sup>279</sup> By the end of the 1930s consumption had replaced production as the gravitational center of American culture, the effects of which would be most deeply experienced and expressed in the postwar period.<sup>280</sup> Diving more deeply into the context of the growing prominence and power of America’s consumer culture, this chapter examines the ways in which electric light was presented and

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<sup>276</sup> See for example Kenneth Dameron, “The Consumer Movement,” *Harvard Business Review* 17 (Spring 1939): 217-89; and Cohen, *A Consumers’ Republic*, 31-41.

<sup>277</sup> Lizabeth Cohen, “The New Deal State and the Making of Citizen Consumers,” *Getting and Spending: European and American Consumer Societies in the Twentieth Century* (Cambridge University Press, 1998): 111-125; quoted text on 116.

<sup>278</sup> Cohen, *A Consumers’ Republic*, 27.

<sup>279</sup> See Chapter 1, “Narratives of Progress,” especially 25-52.

<sup>280</sup> See Susman, “The Culture of the Thirties,” in *Culture as History*, 150-183.



promoted to the consuming public, invoking concepts and strategies characteristic of both citizen consumers and purchaser consumers.

Focusing most closely however on purchaser consumers, this chapter will examine the efforts of the electric industry, in conjunction with a host of cultural authorities, to appeal to a specific demographic—women purchaser consumers. Calling upon both gendered and culturally constructed beliefs and practices informing feminine identity and agency, this chapter explores the mechanisms through which the electric industry situated the use of electric light as central to the responsibilities of women, especially in terms of their social roles and obligations as homemakers in maintaining and protecting their homes, families, and the American standard of living. Examining the influence of women on the development of lighting in the United States both as subjects of and participants in the electric industry's efforts, this chapter highlights their roles as consumers and homemakers, advice columnists and beauty experts, interior decorators and home economists, as well as consultants and residential lighting specialists.

Picking up on many of the themes established in the first two chapters, this chapter begins by looking back briefly to the late nineteenth century, identifying the discourses and practices informing women's roles and identities in the twentieth-century, most especially those regarding beauty and character, domesticity and the design of the domestic interior. Beginning with the transition from flame-based illuminations sources to the widespread adoption of electric light, this chapter identifies continuities linking concerns regarding the use of artificial light and its impact on the appearance of people, colors, and interiors, spanning this period of transition, as well as highlighting the opportunities presented by electric light in easing these vexing problems. After establishing this foundation, the chapter will focus closely on the purposeful codification of gendered beliefs and practices regarding specific uses and applications of electric lighting, calling attention to a number of voices

contributing to the domestication of electric lighting — voices that belonged to both women and men in the years leading up to and following World War II. Analyzing the historical conditions that shaped the development of such gendered discourses and practices in this way affords an important lens on the construction and development of key aspects of the cultures of electric light in the United States during the first half of the twentieth century.

### **Women Consumers: Gendered Discourses**

The formative role of gendered cultural expectations in the everyday lives of American women from the mid-nineteenth century onward has served as a vibrant focus of scholarly debate for at least two decades, and continues to be an area of significant value to any investigation of the domestication and consumption of electric light in the United States. The great body of scholarship in the United States and Britain addressing the formations and agencies of womanhood, and manhood for that matter, has demonstrated the centrality of gender in the construction and negotiation of cultural meanings and material relations.<sup>281</sup> For women cultural expectations of gender often focused on domestic roles and responsibilities, as well as notions of femininity. Such social expectations of female behavior and appearance were well established within American culture by the turn of the twentieth century. In this period women were inundated with domestic advice in newspaper columns, magazines,

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<sup>281</sup> See for example, Judy Attfield and Pat Kirkham, *A View from the Interior: Feminism, Women, and Design* (Women's Press, 1989); Sarah Berry, "Hollywood Exoticism: Cosmetics and Color in the 1930s," in *Hollywood Goes Shopping*, ed.s, David Dresser and Garth S. Jowett (Minneapolis: University of Minnesota Press, 2000), 108-138; Victoria de Grazia, ed., *The Sex of Things: Gender and Consumption in Historical Perspective* (Berkeley: Univ. of California Press, 1996); Beverly Gordon, "Woman's Domestic Body: the Conceptual Conflation of Women and Interiors in the Industrial Age," *Winterthur Portfolio*, vol. 31, no. 4 (Winter, 1996): 281-301; Karen Halttunen, "From Parlor to Living Room: Domestic Space, Interior Decoration, and the Culture of Personality," in *Consuming Visions: Accumulation and Display of Goods in America 1880-1920*, ed. Simon J. Bronner (New York: W.W. Norton & Company, 1989): 157-190; Joanne Meyerowitz, "Beyond the Feminine Mystique," in *Not June Cleaver: Women and Gender in Postwar America, 1945-1960* (Philadelphia: Temple University Press, 1994); Evelyn Nakano Glenn, "The Social Construction and Institutionalization of Gender and Race," in *Revisioning Gender*, ed. Myra Marx Ferree, Judith Lorber, and Beth Hess (Walnut Creek, CA: Altamira Press, 2000), 3-43; Alice Kessler-Harris, "Ideologies and Innovations: Gender Dimensions of Business History," *Business and Economic History* 20 (1991): 45-51; and Wendy Gamber, "Gendered Concerns: Thoughts on the History of Business and the History of Women," *Business and Economic History* 23 (Fall 1994): 139-40.

etiquette manuals, and advertisements about how to be better mothers, cooks, hostesses, housekeepers, decorators, and consumers. One subset of this advice literature that cut across spheres, private and public, young and old, single and married, was beauty. Like gender, feminine beauty was and is a social and cultural construction, long considered a primary constituent of female identity. In addition to hair dyes, powders, rouge, lipstick and other cosmetic aids, electric lighting was among the personal tools promoted for enhancing feminine beauty in this period.

Drawing upon commonly held notions of feminine beauty, a variety of electric lighting products and applications were marketed specifically to women as modern, electrified beauty aids. Regardless of brand or product, emphasis was consistently placed on the flattering qualities of electric light for both women and the domestic interior. These marketing strategies situated electric light within established discourses regarding personal beauty and expression, as well as that of the decoration of the home, thereby positioning electric light as a central agent in the formation of female identity.

More than novelties, gendered lighting products and applications are an important part of the material and cultural history of electric lighting in the United States. These products and applications targeted the increasing economic and cultural influence of female consumers in the mid-twentieth century, engaging with gendered assumptions of women's agency and identity within the domestic environment. Furthermore, the narratives employed by the electric industry in marketing gendered lighting applications to women represent a particular iteration of a larger, entrenched discourse on feminine beauty, its composition, and extension to the domestic interior. Guidelines for feminine beauty originating in the Victorian period and stretching well into the twentieth century encouraged the harmonizing of a number of elements, including individual temperament or personality, complexion and coloration, and décor. With the popular adoption of electric light around the turn of the century, the necessity

of addressing lighting conditions became a further responsibility for women. The development of Hollywood cinematography and the American star system in the early 1920s fueled awareness of electric lighting as a modern beauty aid, as starlets, make up artists, and cinematographers promoted its benefits in popular media.

As a culturally constructed aspect of identity, beauty also implicated other related social beliefs and practices. The intersection of dominant American notions regarding gender, social status, and race can be identified in the marketing of electricity and electric lighting applications in the first half of the twentieth-century. In this period the electric industry achieved tremendous growth as utilities steadily built electrical load, focusing on increasing both efficiency and scale of energy production.<sup>282</sup> In order to increase consumer demand and balance the load to match increases in the production of energy, the industry needed to diversify the nation's electricity consumption. In addition to a raft of newly electrified domestic appliances introduced in the early decades of the twentieth century—as demonstrated at G.E.'s 1915 Panama-Pacific exhibition, the Home Electrical—residential electric lighting became a prime focus of the industry's colonization of the American consumer market, as discussed in Chapter 1.<sup>283</sup> Lighting manufacturers, working in partnership with electrical utilities and other industry organizations, developed specialized marketing campaigns and outreach activities to sell lighting to residential customers.

With lighting products developed to enhance Caucasian skin tones, residential lighting demonstrations in white-only housing developments, and marketing imagery representing white middle-class women, men, and families, the industry specifically engaged key signifiers of gender and race, grounded in the privileged position of white culture in pre-civil rights America. In this period particularly, whiteness both defined and embodied cultural

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<sup>282</sup> Richard Hirsch, *Technology and Transformation in the American Electric Utility Industry* (New York: Cambridge University Press, 1989), 1–46.

<sup>283</sup> See Chapter 1, “Narratives of Progress,” 69–71.

norms in the United States. While the marketing of electric lighting was not overtly exclusionary of any particular race, it unquestionably reflected and represented a white middle-class ideal. In order to understand and destabilize the power of such a paradigm, media theorist Richard Dyer has argued for the need to recognize whiteness as a racial condition. He describes how “whiteness” is perceived among white Western society as a “human condition” that “both defines normality and fully inhabits it.”<sup>284</sup> In looking closely at key aspects of this inhabitation in the context of the rise of American consumer culture in the first half of the twentieth century, one must acknowledge whiteness as an unavoidable backdrop against which notions of gender, race, social status, and identity were deployed in the promotion and marketing of electric lighting.

From the late 1920s onward the marketing rhetoric of the electric industry relentlessly encouraged American women to adopt electric lighting as an aid to beauty and domestic maintenance. Calling upon a host of cultural authorities, the industry promoted electric lighting as a powerful and highly individual visual enhancer. Across a range of popular literature, women were offered access to the glamorous advantages of Hollywood starlets with the incorporation of electric lighting into their beauty regimes and surroundings. However such promises were consistently issued along with warnings of the negative repercussions of unflattering cosmetic effects and social embarrassment if electric lighting was not utilized correctly.<sup>285</sup>

In such popular parables, electric lighting was linked with social acceptance and importantly, notions of glamor. As Alice Friedman argues in *American Glamour*, the meaning of this term grows out of “a web of shared references, narratives, and cultural values,” largely grounded in the visual language of Hollywood and the American fascination

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<sup>284</sup> Richard Dyer, *White* (New York: Routledge, 1997), 9.

<sup>285</sup> See for example, Antoinette Donnelly, “Good Lighting is Half the Trick in Applying Makeup,” *Chicago Daily Tribune* Aug. 5, 1926, p.27; “Begone, Ye Paint, Powder! Make-up by Light Has Come,” *Los Angeles Times*, Jun. 12, 1927, p.28; Rosalind Shaffer, “Makeup Expert Able to Paint Personality on Faces,” *Chicago Daily Tribune* Aug. 25, 1935, D7.

with charm and good looks.<sup>286</sup> Historically correlated with mystery, illusion, enchantment, seduction, and irresistible attractiveness, glamor was well suited to both the cultural industry of Hollywood and to the commercial interests of the burgeoning United States electric industry. In his study of the mechanisms of Hollywood glamor in the 1930s, Stephen Gundle describes the translation of these strategies to the marketing of consumer products through promises of “instant transformation and entry into the realm of desire.” He argues that such commercial narratives of glamor were achieved by “adding colorful, desirable, and satisfying ideas and images to mundane products, enabling them to speak not merely to needs but to longings and dreams.”<sup>287</sup> General Electric, Westinghouse, and Sylvania, America’s largest electrical manufacturers in the mid twentieth century, led the industry with their efforts to build new markets for electric light, developing gendered marketing strategies grounded in such notions of glamor and self-transformation.

Drawing evidence from a number of primary texts, including women’s magazines, lighting and electrical industry trade journals, manufacturer-generated marketing materials, and popular home decoration and beauty advice literature, the following discussion will examine the ways in which cultural beliefs about feminine beauty, identity, and domestic maintenance were correlated to appropriate lighting choices throughout the first half of the twentieth century, culminating in a proliferation of gendered lighting rhetoric and applications in the 1950s. Despite the prominence of such messages in popular media during the period however, evidence of the individual reception of these marketing strategies and lighting applications is scant. Far from suggesting that American women accepted such messages with unquestioning compliance, the following discussion offers a foundation for

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<sup>286</sup> Alice Friedman, *American Glamour and the Evolution of Modern Architecture* (New Haven: Yale University Press, 2010), 13–14.

<sup>287</sup> Stephen Gundle, “Hollywood Glamour and Mass Consumption in Postwar Italy,” *Journal of Cold War Studies* 4, no. 3 (Summer, 2002): 95–118.

analyzing some of the ways in which the electric industry sought to domesticate electric lighting by appealing to women consumers.<sup>288</sup>

### **Color Harmony and Discord in the Domestic Interior**

Concerns about color distortions caused by artificial light predate its introduction, and indeed were common in the nineteenth century with the widespread use of gas and kerosene lamps. Etiquette manuals and home decoration journals described muddied colors and sickly complexions produced when personal attire and interior furnishings were not coordinated in relation to the effects of artificial light. Such warnings typically were included within more general advice literature addressing color palette selection for women and the domestic interior. *Hill's Manual of Social and Business Forms* of 1885, for example, provided just such instruction, offering detailed descriptions of the appropriate colors to be worn by the major "complexion types" of white women.<sup>289</sup> Defining the colors suitable to each type, Hill suggested a range of flattering and harmonious color combinations, followed by notes concerning the most suitable colors and color combinations for each complexion type.<sup>290</sup> In addition, Hill delineated which of these were best by night, cautioning readers that while a dress of a given color "may be beautiful by the day" under the illumination of gaslight at night one might find it to be entirely "lacking in beauty."<sup>291</sup> Pale yellow, for example Hill advised, while "handsome by day," becomes "muddy in appearance by gaslight." Likewise,

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<sup>288</sup> On the deconstruction of monolithic representations of American women as complacent housewives, see Meyerowitz, "Beyond the Feminine Mystique," in *Not June Cleaver*.

<sup>289</sup> Thomas. E. Hill, *Hills Manual of Social And Business Forms* (Chicago: Hill Standard Book Co., Publishers, 1885), 176.

<sup>290</sup> For example Hill suggests, "Dark violet, intermixed with lilac and blue, give additional charms to the fair-haired, ruddy blonde. Green also, with lighter or darker tints, is favourable. With the very ruddy, the blue and green should be darker rather than lighter. An intermixture of white may likewise go with these colors." Hill, 176.

<sup>291</sup> *Ibid.*

Hill warned that, “the beauty of rose-color disappears under the gaslight; and all shades of purple and lilac, the dark-blues and green, lose their brilliancy in artificial light.”<sup>292</sup>

A. Ashmun Kelly writing for *The Decorator and Furnisher* in 1895, likewise outlined the aesthetic challenges presented by the use of artificial lighting, giving particular attention to the decoration of the domestic interior and the appearance of the women within it, writing:

Interior decorations and furnishings, and likewise the clothing and complexions of persons are, as it is well known, greatly modified in color by having artificial light, especially that from gas or kerosene, fall upon them. Sometimes, and indeed very often, these effects prove quite serious matters, changing entire aspects of rooms, and giving a very undesirable and displeasing hue to the skin.<sup>293</sup>

Promisingly however, Kelly suggested that such conditions could be minimized, “greatly modified, or even removed altogether” with knowledge of “the laws governing color and its source—daylight.”<sup>294</sup>

Describing a great number of potential color combinations for individual complexion types and interior palettes in relation to the mutating effects of artificial lighting, it becomes apparent from Kelly’s instructions that this is not a simple matter. Rather, the proposed solution required a sophisticated understanding of the “principles of colors, their combinations, proportions, tints, shades, and hues.” With such knowledge in hand, Kelly suggested, one might then “properly estimate the varied harmony or discordant effects upon each other when placed in juxtaposition.”<sup>295</sup> The new technology of electric light offered potential simplification of these complex calculations and compositions because, as Kelly proposed, it was much “like sunlight in appearance and effect,” with only a slight “tendency towards red,” thereby greatly minimizing color distortions.<sup>296</sup>

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<sup>292</sup> Ibid.

<sup>293</sup> A. Ashmun Kelly, “Modifications in Colors Produced by Colored or Artificial Lights Falling Upon Them,” *The Decorator and Furnisher*, Vol. 25, No. 4 (Jan., 1895), 143-145.

<sup>294</sup> Ibid., 143.

<sup>295</sup> Ibid., 145.

<sup>296</sup> Ibid., 144.



No doubt owing to the obvious difficulty of creating and maintaining personal and interior color harmonies, popular literature addressing the domestic environment and feminine beauty in the later nineteenth century frequently organized advice around individual complexion types, as demonstrated in both examples above. Expectations governing the negotiation of chromatic resonance between one's own complexion type and surroundings were related to the historic conflation of female identity with the domestic interior. Historian Beverly Gordon explores such correspondences between women's identities and the domestic sphere during the later parts of the nineteenth century in her classic essay, "Woman's Domestic Body," arguing that:

The woman was to present herself—and through herself, her family—as up-to-date, fashionable, and prosperous, but she was never to appear too showy or obvious, as it was her inner character that was to come through in her home and on her person.<sup>297</sup>

Such gendered expectations of a revealing of one's "inner character" through the decoration of the interior and oneself can also be found in the discourse addressing beauty products during the period. As increasingly powerful and plentiful sources of artificial illumination became available for domestic use, the implications of these light sources upon the presentation and coordination of women's appearances as well as that of the environments of their making became an increasing focus of advice literature in the first decades of the twentieth century.

### **Flattering Complexions**

Extending beyond feminine considerations of complexion type and environmental color coordination, the mass production and marketing of convenient make-up products added another element to the popular discourse on beauty and social acceptability for women in this

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<sup>297</sup> Gordon, "Woman's Domestic Body," 286.

period. The marketing of personal cosmetics to American women in the early twentieth century drew upon a broad range of commonly-held notions regarding gender, personality, and complexion type, while engaging with the nation's aspirational consumer culture and the promise of social mobility.<sup>298</sup> Increasing emphasis on personal transformation represented a significant shift from the nineteenth-century focus on revealing moral and spiritual character through the enhancement of one's natural complexion. As Kathy Peiss, a historian of the American cosmetics industry, has suggested, in this period feminine beauty was seen as "originating less in visual sensation and formal aesthetics than in internal character." She describes how nineteenth-century "writers specifically marked expressive eyes and transparent complexion as the critical media linking surface beauty to inner spirit."<sup>299</sup> Prioritizing the external translation of an interior spirituality or righteous character, American women were offered an array of "moral cosmetics"—such as soap, lotions, exercise, and temperance—as aids in enhancing the communication of these characteristics.<sup>300</sup>

By the late nineteenth century the promotion and use of applied, visible cosmetics was becoming more common, particularly among women holding public positions where it was seen as an aid in performing such roles. Stage actresses, with their reputations as popular icons, were employed in the promotion of cosmetics, often in the form of advertising testimonials.<sup>301</sup> Similarly, the increasing popularity of photographic portraiture, where corrective cosmetics were frequently used, also contributed to the social legitimization of make-up as a beauty aid. Together such public displays and endorsements of cosmetics paved the way for the acceptance of a new cultural ideal of female beauty, one that emphasized personal transformation and social mobility.

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<sup>298</sup> As discussed in Chapter 2, "Invisible Mechanisms of Modernism," 117-123.

<sup>299</sup> Kathy Peiss, "Making Up, Making Over: Cosmetics, Consumer Culture, and Women's Identity," in *The Sex of Things*, edited by Victoria de Grazia and Ellen Furlough (Berkeley, Ca.: University of California Press, 1996): 331-336, quote on pg. 313.

<sup>300</sup> Peiss, "Making Up, Making Over," 313.

<sup>301</sup> *Ibid.*, 320-322.

### **Make-up and Light for Day and Night**

The popularization of applied cosmetics in the United States among female consumers was tied to expanding social access and public roles for women, as well as to the increasing presence of new communication and entertainment media in American popular culture.<sup>302</sup> As the use of cosmetics became more socially acceptable in the early twentieth century, women's advice literature began to distinguish between appropriate make-up applications for day as opposed to those suitable for nighttime environments and activities.<sup>303</sup>

Along with the distinction between make-up applications for day versus night, came increasing anxiety about the effects of artificial light on the relative appearance of cosmetics, particularly colored rouge and lipstick.<sup>304</sup> The rapid spread of electric light in public environments was a primary culprit according to prominent advisors on feminine beauty, such as syndicated columnist Antoinette Donnelly, who wrote for the *New York Daily News* from 1919 until 1963, and often incorporated specific details about lighting in her advice to readers.<sup>305</sup> Previously concern regarding flame-based illuminates had centered on the potential of airborne fumes produced by the burning gas to oxidize the compounds used in women's cosmetics, turning pale pink powders into muddy, opaque browns. With electric light however, the primary danger was not affecting the chemistry of cosmetics—something

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<sup>302</sup> On the influence of modern mass media in the development of American women's cultural agency as consumers see, Martha May, *Women's Roles in Twentieth-Century America* (ABC-CLIO, 2009); and Lynn Spiegel and Denise Mann, "Women and Consumer Culture: A Selective Bibliography," *Quarterly Review of Film and Video* 11 (1989): 85-105.

<sup>303</sup> For example, the use of face powder and rouge was specially advised for environments characterized by "artificial light, spectacle, and pleasures." In Peiss, "Making Up, Making Over," 322.

<sup>304</sup> Antoinette Donnelly, "Good Lighting Is Half the Trick in Applying Makeup," *Chicago Daily Tribune*, August 5, 1926, 27.

<sup>305</sup> See Antoinette Donnelly, "Cosmetics Drive Away the Blues," *Chicago Daily Tribune*, June 12, 1927, and "These Little Tricks Will Add Beauty to the Eyes of a Femme," *Chicago Daily Tribune*, February 25, 1928. In addition to the *New York Daily News* Donnelly wrote for a number of other daily newspapers and was credited with receiving as many as ten thousand letters a day. For biographical details on Donnelly, who also penned women's advice literature under the name Doris Blake, see "N.Y. News Columnist Antoinette Donnelly Dies," *Washington Post, Times Herald*, November 17, 1964; and Kathy Peiss, who also briefly discusses Donnelly in "American Women and the Making of Modern Consumer Culture," *The Journal for Multimedia History* 1, no.1 (Fall 1998), accessed <http://www.albany.edu/jmmh/vol1no1/peiss-text.html#fn5r>.

all but out of individual control—but rather of incorrectly anticipating the effect of lighting conditions on the appearance of one’s make-up. According to popular sources like Donnelly, women ran the risk of social ridicule and embarrassment if make-up was applied under incorrect lighting conditions. As Donnelly described,

The dangerous possibility nowadays appears to be not from fumes, but from use of electric light when making up for the street. In crowded centers it is rather the exceptional woman who uses daylight when she applies makeup for daylight wear. It is due to the electric light then that we see so many instances of poorly applied rouge.<sup>306</sup>

The difference between make-up appropriate for daylight as opposed to that which would be seen in electric light was significant and not to be ignored according to Donnelly, as she advised readers, “No more can you consider the day makeup for night wear.”<sup>307</sup> Suggesting that a woman should not underestimate the importance of artistry and the skillful navigation of light sources when preparing her toilette, Donnelly summarized: “Getting the right color of rouge is but half the trick of a clever makeup. The other and bigger half is putting it on under the right light.”<sup>308</sup> Emphasis on utilizing the same type of light when applying make-up as one would later be seen in was echoed throughout women’s advice literature during this period. The direct correlation between color perception and lighting conditions provided a scientific rationale for such instructions, as women were reminded that the color spectrum of any given form of illumination would greatly impact the relative appearance of colors, including cosmetics. The premier make-up artist of Hollywood’s golden age, Max Factor, instructed women not to forget, “Light is the source of all color.”<sup>309</sup>

By the early 1920s popular guidance on a woman’s toilette included the application of occasion-specific cosmetics, with special attention given to the time of day and type of illumination in which she would later be seen. Having done so, she must then coordinate her

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<sup>306</sup> Donnelly, “Good lighting is Half the Trick in Applying Makeup,” 27.

<sup>307</sup> Ibid.

<sup>308</sup> Ibid.

<sup>309</sup> Mamy Ober Peak, “Hollywood’s Master of Make-Up,” p.E3.

make-up to best enhance her complexion type and attire, and with confidence that these colors would appear suitable for the course of her activities. Donnelly described this regime with some exasperation for those that neglected such advice:

Get your dressing table, then, over near the window so the bright light falls directly on your makeup work. Or, if your appearance is to be made at an evening function, get the benefit of clear electric lighting on it. This may seem a small detail, but it is not. Personally, I think it is the reason one sees as many poorly matched complexions and badly applied makeup as one does. Heaven knows it isn't that women are not anxious to create the best of effects.<sup>310</sup>

### **Women's Vanities: Dressing Tables, Mirrors, and Electric Lighting**

Certainly the repeated urging in newspaper advice columns and popular magazine to consider one's lighting carefully when making-up did little to ease women's anxiousness regarding their appearance. Amplifying these concerns, electric industry advertisements from the period also emphasized the necessity of utilizing appropriate lighting when applying make-up, offering women relief with a variety of simple solutions. A General Electric advertisement appearing in *Better Homes and Gardens* in 1931, inquired of its readers: "Can you light your bedroom correctly?" Quelling any fears of incompetence in the illumination of the bedroom and dressing table, General Electric provided a colorful schematic illustration indicating where lighting should be installed and what types were best for different tasks. Suggesting that good lighting, such as that produced by Edison Mazda lamps would "add to the pleasure of preparing your toilet," the advertisement reassured women that it would also protect against the "grotesque coloring of lips and cheeks" resulting from poor lighting at vanity mirrors.<sup>311</sup>

Along with increasing attention to make-up and lighting in the daily female toilette came the introduction of specialized dressing tables, equipped with electric lighting that

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<sup>310</sup> Antoinette Donnelly, "Antoinette Gives Several Practical Rules for Makeup," *Chicago Daily Tribune*, January 23, 1932, 15.

<sup>311</sup> General Electric, Edison Mazda Lamps, "Can you light your bedroom correctly?" appearing in *Better Homes and Gardens*, April 4, 1931, inside front cover.

could be adjusted to respond to the requirements of the modern beauty regime. Women's magazines and newspaper columns of the 1920s and 30s frequently featured items regarding the design and use of the dressing table.<sup>312</sup> The full dressing table ensemble was typically comprised of a chair or stool scaled to match a small table or dresser with drawers, and a mirror. Often decorated with taffeta and other feminine accouterments and available in any number of historically inspired styles, the dressing table was both a symbol and agent of womanhood. Advising readers on the selection of one's dressing table, *Vogue* magazine stressed its formative role in the transition from girl to woman: "Every young feminine thing sighs for a dressing-table the day that the first young male thing looks at her with understanding."<sup>313</sup> Such narratives empowered the look of a potential male suitor with the ability to activate a young woman's awareness of her social role and status in relation to standards of beauty. Womanhood in this context was predicated on the knowing management of one's social appearance or "look". Importantly the dressing table allowed women to examine and adjust their "look" through a reflected image—a proxy for the male gaze. Such inspections required the ability to see oneself from a variety of angles and light conditions, underscoring the necessary inclusion of electric lighting and adjustable mirrors. *Vogue* magazine described the advantages of modern dressing tables, suggesting: "its many mirrors and its lighting tell the whole truth about the woman before it with an honesty that is an inevitable spur to wise vanity."<sup>314</sup>

The dressing table also provided another point of connection between the theater and popular applications of electric lighting. In her review of Bernard Sobel's *Theater Handbook*, Antoinette Donnelly described the many techniques that the average woman could borrow from theater stagecraft and make-up artists. Repeatedly emphasizing the importance of

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<sup>312</sup> See for example, Lois Shirley, "How to Make your Dressing Table Attractive," *Photoplay* v.36, n.1 (June, 1929), 68-69, 122.

<sup>313</sup> "Choosing the Dressing-Table, *Vogue* v.72, n.11, November 24, 1928: 78, 79, 126.

<sup>314</sup> "Six Original Designs for that Wise Form of Vanity, the Dressing Table," *Vogue* v.64, n10, November 15, 1924.

“regarding (oneself) from the point of view of the audience,” Donnelly instructed her readers to consider “the closeups our audience get [sic] of us” when sitting at the dressing table.<sup>315</sup> Keeping the audience in mind (and at close distance), she advised women to strive for smoothness, evenness, and proper color blending so that one might present as near a perfect image as possible from any angle. Returning to the importance of good lighting when applying make-up, Donnelly provocatively suggested that correct lighting was essential in “making a lady what she ain’t.”<sup>316</sup>

In this and other similar articles there is a subtle tension between the perceived honesty of the mirror and the woman’s role in correctly assessing the information it reflected in order to apply make-up appropriately. In much of the beauty advice from the 1920s and 1930s, concern was commonly expressed that women were not attentive enough to their image, that they were not honest enough, and that they did not look closely enough to identify errors or opportunities. Correct lighting was presented as a means of combating such tendencies. Elsie Pierce writing for *The Baltimore Sun* claimed that success in applying make-up depended upon use of “the proper mirrors and the right light.”<sup>317</sup> The article was illustrated with photographs of Hollywood stars Claire Trevor and Janet Gaynor seated at their dressing tables. The captions informed readers of Trevor’s attention to the “flawlessness of her finishing touches” and of Gaynor’s knowledge of “the importance of surrounding herself with mirrors that light up.”<sup>318</sup>

As if women were inherently incapable of seeing themselves clearly and making rational choices when it came to their own beauty regime, Donnelly reprimanded women who knowingly applied their make-up in “corners of rooms where good light is hampered by

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<sup>315</sup> Antoinette Donnelly, “Theater has Makeup Tips for Amateurs,” *Chicago Daily Tribune*, May 10, 1940, 26.

<sup>316</sup> Donnelly, “Theater has Makeup Tips for Amateurs.”

<sup>317</sup> Elsie Pierce, “Dressing Table—Beauty Shrine,” *The Baltimore Sun*, November 26, 1933, TM8.

<sup>318</sup> Pierce, “Dressing Table—Beauty Shrine.”

taffeta curtains or chintz.”<sup>319</sup> After overcoming the seduction of chintz flounces and taffeta festoons, and ensuring ample light, then and only then, could a woman properly identify her complexion type—the necessary starting point for selecting and applying cosmetics. Establishing the perfect environmental conditions was just a first step however. Suggesting that even with such conditions in place, many women were still unable to assess the best color arrangements to suit their own complexions, she argued, “we get color complexes. We are set against a shade, or we go sentimental over another.”<sup>320</sup> To ward off such self-deception Donnelly proposed women seek the assistance of a friend in identifying the most becoming colors for their complexion type. This suggestion of a prejudicial vision, informed by sentimentality or an irrational dislike of particular hues, reveals a cultural assumption of a feminine incapacity to color coordinate. Furthermore the description of chintz window dressing, blocking daylight from entering the dressing room similarly exposes the gendered prejudices that assigned a women a feminine compulsion to decorate and feminize as an expression of self—even against the knowledge that it might block needed daylight.<sup>321</sup>

### **Beauty, Personality, and the Culture of Abundance**

Another aspect central to the negotiation of gender and identity in the twentieth century was the increasing prominence of *personality* and its expression, particularly in the first half of the twentieth century. In this period, personality gradually replaced the nineteenth-century association with character as that which defined an individual. The growing emphasis on the infinitely more mutable expression of personality, as opposed to the more stable notion of character, was unmistakable in the popular discourse addressing beauty and women’s social roles by the 1930s. This was a shift that would have increasing significance for the

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<sup>319</sup> Donnelly, “Antoinette Gives Several Practical Rules,” p.15.

<sup>320</sup> Ibid.

<sup>321</sup> On curtains and the gendered discourse on domestic decoration practices, see Margaret Maile Petty, “Curtains and the Soft Architecture of the American Postwar Domestic Environment,” *Home Cultures* vol. 9, no. 1 (2012): 35-56.



development of American consumer culture in the 1940s and 50s. While one's character—which was based upon Puritan beliefs regarding the foundations of a moral society—had served as an important component of nineteenth-century American society, such beliefs were replaced in the twentieth century by a secular and individualistic identification with personality.<sup>322</sup> Historian Warren Susman has attributed this shift to the nation's transition from a producer-based society to one that was decidedly consumer-oriented. Susman identified the concomitant emergence of a “new modal psychological type” within the American middle class in this period as a response to the nation's newfound “culture of abundance.”<sup>323</sup> As Susman argues, “The older culture—Puritan-republican, producer-capitalist—demanded something it called ‘character,’ which stressed moral qualities, whereas the new culture insisted on ‘personality,’ which emphasized being liked and admired.”<sup>324</sup>

Susman's identification of personality, and in particular its agency in efforts to gain social acceptance and praise in the first decades of the twentieth century is of particular value when analyzing both the discourse on beauty and the marketing of electric light to women consumer in the United States during this period. Across a range of popular media and industry marketing materials, personality was associated with specific beauty types (largely replacing the previous emphasis on complexion types) and was utilized in the promotion of a variety of consumer goods.

In this period popular culture celebrated well-know personalities from the theater and Hollywood's emerging star culture as models of new and more fluid expressions of female beauty. The cultivation of the right personality was equated with the ability to make the right impression, get the right job, or capture the attention of the right man. Beauty, as expressed through the lens of personality, was wedded to individual identity and social agency for

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<sup>322</sup> See, Bronner, *Consuming Vision*, 4.

<sup>323</sup> Susman, *Culture as History*, xix-xxi, see especially chapter 14, “‘Personality’ and the Making of Twentieth-century Culture,” 271-286.

<sup>324</sup> Quoting a period source on this, Susman writes: “character, he insists, is either good or bad; personality, famous or infamous.” Susman, xxii, 273-277.

American women. Closely aligned with Susman's culture of abundance, Sarah Berry, a historian of Hollywood's star culture, has identified the emergence of a "democratic" concept of beauty coincident with increasing emphasis on personality in the United States. Berry argues that this new model of beauty was predicated upon the logic of a consumer economy, particularly in its proposition that any and every woman could be beautiful with the advantage of "good grooming and makeup."<sup>325</sup> Proposing that beauty held a recognized value for women within the nation's growing consumer and service economy, Berry suggests, that as such, it was commonly understood as a legitimate and highly valuable form of social capital, writing, "Women's cosmetic self-maintenance came to be seen as one of the requirements of feminine social values, rather than an unethical preoccupation with personal vanity."<sup>326</sup>

Such notions are easily identified in the popular discourse on modern beauty standards in the United States from the 1920s onwards. However, social anxieties associated with the failure to meet these standards continued to accompany or be implied in these sources, as evidenced in such advice as that given by Max Factor in an interview from 1929:

Beauty is more than skin deep when observed by the onlooker. It is everything. It creates the first impression. It may be the key to happiness and success, the open door through which a girl finds access to those things most desired. Nature's work is often incomplete. Beauty is naturalness—idealized.<sup>327</sup>

The foundation of this amplified "naturalness" for Max Factor was a woman's personality, not her character—something which was well within her power to shape, enhance, and perfect. Factor instructed women to "Stand before a mirror and study your face, your personality. Then put on make-up and see if it harmonizes with your mental and physical self." Much as the nineteenth-century notion of character was meant to animate a woman's

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<sup>325</sup> Sarah Berry, "Hollywood Exoticism: Cosmetics and Color in the 1930s," in *Hollywood Goes Shopping*, edited by David Dresser and Garth S. Jowett (Minneapolis: University of Minnesota Press, 2000), 108-138.

<sup>326</sup> Berry, "Hollywood Exoticism," 111.

<sup>327</sup> Mamy Ober Peak, "Hollywood's Master of Make-Up," *The Hartford Courant*, February 3, 1929, p. E3

beauty (an exterior quality), so too was personality described as an expression, or in Factor's words, a harmonized embodiment of a woman's mental (internal) and physical (external) nature that resulted in beauty.<sup>328</sup> Being able to read one's own personality accurately then provided important clues as to the appropriate type of cosmetic application to communicate these characteristics. Rather than relying on complexion to guide beauty choices as was common in the latter nineteenth century, Factor correlated make-up choices directly to personality type—which sounds remarkably similar to contemporary descriptions of female stars and advertorial text in Hollywood's fan magazines.<sup>329</sup>

While Factor's advice suggested that personality was somehow fixed to intrinsic aspects of a woman's mental and physical self, Hollywood's fan culture celebrated and promoted the transmutability of the personalities and personas of female stars. Within the cosmetics industry particularly there was benefit in shifting emphasis to personality—unlike character or complexion, personality could be altered or exchanged easily through make-up color selection and coordination. Personality, as a dynamic form of identity, could be determined by the individual woman to suit her immediate mood or objectives. Popular fan magazines such as *Photoplay*, *Motion Picture*, *Movie Weekly*, *Screenland* and others regularly featured articles and supposedly candid interviews describing actresses' beauty regimes that drew heavily upon such notions, often alongside advertisements for cosmetics and other beauty products that further reiterated the importance of personality as a starting point for beauty.

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<sup>328</sup> Peak, "Hollywood's Master of Make-Up," E3.

<sup>329</sup> Hollywood fan magazines of the 1920s and 1930s with their broad female readership served not only to disseminate studio approved accounts of the likes, dislikes, relationships and personalities of their stars, but also to extend the industry's influence upon women's commercial culture and modes of representation. See Marsha Orgeron's case study, "Making 'It' in Hollywood: Clara Bow, Fandom, and Consumer Culture," *Cinema Journal* v.42, n. 4 (Summer, 2003): 76-97; on the historical development of Hollywood's star system see Richard de Cordova, *Picture Personalities: The Emergence of the Star System in America* (Chicago: University of Illinois Press, 1990); and more generally, see Richard Dyer, *Heavenly Bodies: Film Stars and Society*, second edition (New York: Routledge, 2004).

The influence of Hollywood was not limited to fan magazines however. An article appearing in the *Chicago Tribune* in 1935 entitled, “Makeup Expert Able to Paint Personality on Faces,” detailed techniques used by film industry make-up artists and cinematographers to create different personalities for popular stars of the era. Offering women step-by-step instructions, the make-up artist Pere Westmore claimed, “It is really possible to paint a personality on a face, using the face as a canvas.”<sup>330</sup> In so doing, Westmore reiterated the idea that a woman’s personality, and therefore beauty, was in no way predetermined, it was as he said a blank canvas upon which she could “paint” the personality she desired. With even greater emphasis on the adaptable nature of personality, the Hollywood starlet Joan Blondell told *Photoplay* readers that, “The whole secret of beauty is change...A girl who neglects changing her personality gets stale mentally as well as physically. So I’m going to vary my hair style, my type of make-up, nail-polish, perfume.”<sup>331</sup> The notion of continual change and renewal as key to beauty, and importantly, as the mechanism through which a woman could access its social benefits as suggested in Blondell’s statement, offers an important insight into the rhetoric of this period and its impact on the development of America’s consumer culture. Sustained consumption practices demand consumer insatiability, that is to say, it is a cultural logic wherein the demands of changing fashions supersede all other concerns regarding consumption practices. And for women in the interwar period, the rhetoric connecting beauty to personality, particularly in association with social acceptance (or rejection), was deeply imbedded in such a methodology.

Such accounts of the mutability of the personality, as a performance of identity realized through consumer choices, were common in beauty advice literature throughout the 1930s and right up until the nation’s involvement in World War II. However, as with many aspects

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<sup>330</sup> Rosalind Shaffer, “Makeup Expert Able to Paint Personality on Faces: Features of a Subject Serve as a Canvas,” *Chicago Daily Tribune*, Aug. 25, 1935, D7.

<sup>331</sup> Carolyn van Wyck, “Photoplay’s Own Beauty Shop,” *Photoplay* (Jan. 1939): 66, as quoted in Berry, 116.

of American culture in this period, no matter how varied the range of personalities and beauty types described in the popular media, by a great majority they all sat within Dyer's definition of "whiteness."<sup>332</sup> For example, *New York Times* beauty columnist Martha Parker wrote in 1943 of a range of facial "lighting effects" possible with a new cosmetic powder that would allow a woman "to change her skin tone to the color of her costume almost as easily as an electrician switches a stage set from rose to gold." According to Parker, the new powder would also allow any woman to "wear any dress shade at all, becomingly."<sup>333</sup> However, the pastel powder products Parker describes clearly were not appropriate for all women—African American women and others with darker toned skin were not afforded such ease of complexion alteration. Just like Hollywood's ingénues and sirens, the role models for beauty in United States were Caucasian with hardly an exception in this period.

Yet in the popular press, such self-transformations actualized through new lipstick hues, facial powders, or other cosmetic fashions were associated with a seemingly democratic opportunity for personal pleasure and empowerment, or what Berry describes as the "pleasure of potentiality."<sup>334</sup> Analogies with stage lighting and cinematography, such as that in Parker's product review, engaged with the fantasy of this potentiality. The promise of realizing similarly dramatic beauty effects as those achieved under theatrical lighting in the marketing of women's beauty aids in the period is indicative of the beauty industry's reliance on such tropes. In a culture so dominated by the presence of film and theater celebrities, it is easy to appreciate the power of the suggestion of being able to access the same glamorous effects as the stars with the flick of a switch. The notion that one could easily change one's look, and therefore one's fate, with the right cosmetics, color choices, and lighting was repeated many times over in any number of sources between the 1930s and the lead up to the nation's entry

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<sup>332</sup> Dyer, *White*, 9.

<sup>333</sup> Martha Parker, "Powder for Beauty," *New York Times*, August 1, 1943, SM23.

<sup>334</sup> Berry, 116. See also, Peiss, *Hope in a Jar*, 200-201.

into World War II, sustaining and strengthening such beliefs as fundamental to feminine agency and identity in the United States. The hold of personality in the performance of key aspects of women's identities—including social standing and mobility—extended well beyond prescriptions for make-up regimes, eventually encompassing the spectrum of women's roles and responsibilities.

### **Personality, Charm and Color and the Domestic Interior**

In the later 1920s and 30s women's advice literature, newspaper columns, and home decoration manuals also began to emphasize the importance of *personality* within the design, decoration, and maintenance of the home. Emily Post was a particularly important voice in the application of a spatialized concept of personality to the domestic environment.

Appearing regularly on radio and television throughout her professional life, in addition to authoring a widely syndicated advice column and publishing a number of popular etiquette manuals, at her death Post was ranked as one of the most powerful women in America, second to only to Eleanor Roosevelt.<sup>335</sup> Post brought popular attention to the notion of personality, first with in her 1922 publication, *Etiquette* and later with the 1930 manual, *The Personality of a House*.<sup>336</sup> Post's popular *Etiquette*, which contained a chapter entitled "Personality of a House" went through numerous editions in the decades following its publication. The book itself was predicated upon a series of articles Post published the year prior in the *Ladies Home Journal* that addressed the role of personality in the design and decoration of one's house, establishing a foundation for her readership on this topic.

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<sup>335</sup> "Emily Post is Dead at 86: Ruled Etiquette Scene for Four Decades," *Chicago Daily Tribune*, September 27, 1960, 1; and Marion Rodgers, "The Woman Behind the Manners," *Washington Times*, November 2, 2008, M26.

<sup>336</sup> Emily Post, *Etiquette in Society, in Business, in Politics, and at Home* (New York: Funk & Wagnalls Company, 1922). Emily Post, *The Personality of a House* (New York: Funk & Wagnalls Company, 1930). On the discursive construction of personality in Post's *Personality of a House* see Karen Halttunen, "From Parlor to Living Room: Domestic Space, Interior Decoration, and the Culture of Personality," in *Consuming Visions: Accumulation and Display of Goods in America 1880-1920*, ed. Simon J. Bronner (New York: W.W. Norton & Company, 1989): 157-190, especially pages 178-187.

Post's concept of personality in many ways was a refinement of gendered nineteenth-century notions closely linking the appearance and psychological spirit of the interior with the character of the female head of the household.<sup>337</sup> While Post argued that the quality of personality as expressed in the home was difficult to define, she suggested that it might be understood best in relation to the emotional experience of the domestic interior, something akin to "charm."<sup>338</sup> Further emphasizing the democratic "potentiality" of personality, Post proposed, "The personality of a house is indefinable, but there never lived a lady of great cultivation and charm whose home, whether a palace, a farm-cottage or a tiny apartment, did not reflect the charm of its owner."<sup>339</sup> Post argued that women should approach the design of the domestic interior as a personalized backdrop for daily life, and as such, that it should rightly embody and express the personality of woman that it frames, writing, "A dwelling should be suggestive of home. Moreover, the house which is to be your home—in short, your background—should unmistakably suggest you. Its personality should express your personality."<sup>340</sup> Without this most basic requirement, Post warned, the space becomes lifeless, drained of its vitality, colorfully suggesting that a house that did not express, "the individuality of its owner is like a dress shown on a wax figure. It may be a beautiful dress—may be a beautiful house—but neither is animated by a living personality."<sup>341</sup> In Post's dramatic dichotomy, a woman's living spirit was indivisible from her personality, and the home a dreary shell without its embodied presence.

Expected to enliven both her attire and her home with the dynamic expression of her personality, women amongst Post's wide readership base may well have connected such

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<sup>337</sup> On this point Gordon quotes Harriet Beecher Stowe from *We and Our Neighbors* (1875): "[Her] self begins to melt away into something higher. . . The *home* becomes [her] center and to her home passes the charm that once was thrown around her person . . . her home is the new impersonation of herself." As quoted in Gordon, "Woman's Domestic Body," 282.

<sup>338</sup> Post, *Etiquette*, see chapter 12, "The Well-Appointed House," 131-164.

<sup>339</sup> *Ibid.*, 132.

<sup>340</sup> Post, *The Personality of a House*, 2-3.

<sup>341</sup> *Ibid.*, 3.

advice with similar contemporary rhetoric stemming from the beauty industry. Another point of intersection between popular discourse addressing personal beauty and the design and decoration of the interior was the notion of charm. Post in particular called attention to its importance in the spatialization of personality in the home, describing charm as being comprised of such qualities as, “beauty, taste, sympathy, appealing manner, and so forth.”<sup>342</sup> Along with personality, charm was also a popular term used to describe the allure of a woman made-up to suit her personality in this period. The growing emphasis on such desirable but difficult to define attributes of personality like charm however, were highly useful in the marketing of products to women. For example in 1929 the *Ladies Home Journal* announced the “return to feminine charm” and promoted the beginning of the “Charm Decade” to manufacturers as a valuable advertising opportunity.<sup>343</sup>

Outlining the ways in which a woman might create a charming and enchanting home that embodies, or at the very least harmonizes, with her personality, Post ranked color selection as among the most important considerations. If seeking to create a “room of charm,” Post advised readers that, “The first thing the average person notices on entering a room is color.”<sup>344</sup> Attentive to the demands of fashion, Post’s emphasis on color should be understood in relation to the growing prominence of color in American popular and consumer culture in later 1930s. In this period color was broadly considered one of the primary modes through which to communicate or modify the expression of one’s personality. As Antoinette Donnelly instructed readers of her beauty column in 1936:

If you have no hobby, girls, let me suggest one. Color! A knowledge of color from the ground up. Study color in relation to your home, your individual personality, your temperament—and yes, your temper...with a good general knowledge of color you may be able to do over your whole personality, to emphasize it, soften it, or develop a brand new one.<sup>345</sup>

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<sup>342</sup> Ibid., 2.

<sup>343</sup> See Peiss, *Hope in a Jar*, 130-131.

<sup>344</sup> Post, *Personality of a House*, 8.

<sup>345</sup> Antoinette Donnelly, “Color Study Is Suggested as Feminine Hobby,” *Chicago Daily Tribune*, September 27, 1936, D4.



Such powerful suggestions of not only enlivening one's appearance or surroundings, but moreover altering one's temperament or developing a "brand new" identity through the artful use of color, again closely tied such gendered consumer choices to a social performance of feminine identity.<sup>346</sup>

### **Lighting for Beauty, Charm, and Livability**

Similarly, such rhetoric was also characteristic of interior decoration advice literature from the period instructing women on how best to approach color selection and coordination in the home. Not surprising given the close and well-known relationship between the perception of color and the quality or type of artificial illumination present, as discussed earlier, electric lighting received increasing attention in domestic advice literature in the later 1920s and throughout the 1930s. As a common and challenging factor influencing color selection and coordination in the home, the era's most prominent tastemakers offered guidance on how to best utilize both electric lighting and color in the composition of the domestic interior.<sup>347</sup>

While this discourse developed simultaneously to that of the machine age interior explored in Chapter 2, in women's literature there was far less emphasis on modernism and its principles and guidance largely focused on the obtainment of more generically attractive and charming spaces—thus again underscoring the highly gendered nature of this discourse.<sup>348</sup>

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<sup>346</sup> For further reading on this important aspect in driving the development of consumer culture in the United States see, Regina Lee Blaszczyk, *The Color Revolution* (Cambridge, Mass.: MIT Press, 2012).

<sup>347</sup> Interestingly, male writers on domestic space more frequently referred to mood or atmosphere as key aspects in the aesthetic cultivation and control in the home. Often lighting played a principle role in establishing these qualities and providing adjustability for different domestic requirements. For example the lighting designer Stanley McCandless advised reader of *House & Garden* in 1937 that "after dark your mood can be controlled by illumination." He also describes three primary ways in which artificial light can affect the experience of an interior, firstly, "pure emotional appeal," secondly, color palette, and lastly, light quality—whether or not it is even and flat or has a high contrast quality. See, "Conditioned Lighting," *House & Garden* (Sept. 1937): 62-63, 74.

<sup>348</sup> Compare for example with the discussion of the use of light in modern interiors and architecture in *Art and the Machine* as well as other popular period sources covered in Chapter 2, "Invisible Mechanisms of Modernism," see 87-91 and 100-107.

*Vogue* magazine, for example, advised its readers in 1925 that, “‘Light is the first of the painters,’ and no room can be attractive unless it is adequately and charmingly lighted.”<sup>349</sup>

Attributing “the failure of many a dinner party” to glaring lights and the spoiling of “countless rooms” due to thoughtless lighting, *Vogue* then introduced Elsie de Wolfe, a celebrity in her own right, to advise readers on the “perfect lighting of livable rooms.”<sup>350</sup> Introduced as a “creator of beauty,” de Wolfe proposed that lighting arrangements must be carefully considered, suggesting that with “proper lighting, the harmony of the home is increased.”<sup>351</sup> One of the more significant challenges to fostering harmonious lighting in the home, according to de Wolfe was the introduction and popularization of colored lampshades for electric lights. A focus of concern in many domestic advice columns, the use of colored lampshades was widely criticized because of the difficulty presented in predicting and coordinating the effects of the light produced by tinted shades. A column appearing in 1927 in the women’s pages of the *Atlanta Constitution* is typical of the address of this persistent concern. The author of the column, Helen M’Kinlay advised readers that,

The colors of lamp shades should be of even greater consideration to the homemaker than any other colors in her home decoration scheme, because lighted colors comport themselves differently from the way they do when unlighted, and to use color satisfactorily it is important to understand them. This fact should be known before incorporating them into the home color scheme.<sup>352</sup>

Far from the celebratory praise of the invisible mechanisms of architectural lighting characteristic in the discussion of the modern interior by the Cheneys or other male architecture and design critics from the period as highlighted in Chapter 2, women’s advice

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<sup>349</sup> Frances Alexander Wellman, “The Perfect Lighting of Livable Rooms: Lighting is a Science that may be Turned into an Art,” *Vogue* 66, 7, October.1, 1925, 82-83, 110.

<sup>350</sup> On Elsie de Wolfe see Grace Lees-Maffei, “Elsie de Wolfe: The Birth of Modern Interior Decoration,” *Journal of Design History* 19, no. 2 (2006): 173-176; Penny Sparke, *Elsie de Wolfe: The Birth of the Modern Interior*, ed. by Mitchell Owens (New York: Acanthus Press, 2005), and Penny Sparke, “The Domestic Interior and the Construction of Self: the New York Homes of Elsie de Wolfe,” in *Interior Design and Identity* (New York: Palgrave, 2004): 72-91.

<sup>351</sup> Wellman, “The Perfect Lighting Of Livable Rooms,” 82.

<sup>352</sup> Helen G. M’Kinlay, “Service as Well as Beauty Factor in Lamp Selection,” *The Atlanta Constitution*, May 22, 1927, 16.

literature tending to be more scolding and prescriptive in tone and focused on guiding consumer choices.<sup>353</sup>

Returning to *Vogue* magazine, an example of the typical language and objectives of such advice literature can be found in an article by the well-known English interior decorator and tastemaker, Syrie Maugham. Offering guidance on the selection of light fixtures and shades for large rooms, Maugham set out the context of the problem—as a social one—for readers, noting that “Lighting a large room where people receive is a decorative problem that always requires much consideration.”<sup>354</sup> Describing a variety of potential uses for such spaces, Maugham suggested that, “In arranging the lighting of a drawing-room, there are many things to remember. First, there is attention to the colour scheme of the room. Lights can kill colour, or give it rebirth.”<sup>355</sup> In order to avoid the untimely and socially awkward death of one’s color palette, Maugham advised adamantly against “shades in strong colours for any lighting fixtures,” because she emphasized, they “entirely destroy the fixed personality of a room.” In conclusion, Maugham united the elements of color harmony, lighting, and personality, reminding readers that above all, it was the hostess’s responsibility to provide flattering conditions for her guests, advising, “For the guest who brings her vanity—and most guests do—there should be two or three chairs bathed in a mellow radiance that is displaying and becoming.”<sup>356</sup>

The notion that a woman was responsible for creating an environment where both she and her guests would *appear* at their most attractive was common in domestic advice literature throughout the first half of the twentieth century, and pervasive after the World War II with the expanded role of lifestyle maintenance in popular discourse. While some

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<sup>353</sup> Chapter 2, “Invisible Mechanisms of Modernism,” see 87-91 and 100-107; also Cheney and Cheney, 181-202; and Walter Rendell Storey, “Unity a Keynote in Modern Rooms,” *New York Times*, January 13, 1935, SM12.

<sup>354</sup> Ms. (Syrie) Somerset Maugham, “Lights and Shades in a Large Room,” *Vogue* 65, 6, March 1, 1925, 69-70.

<sup>355</sup> *Ibid.*, 69.

<sup>356</sup> *Ibid.*

authorities like Maugham advocated for the complete avoidance of colored light (not surprising given her fame for pale, monochromatic interiors) others suggested that the judicious use of colored light could add to the beauty of the home, homemaker, and guests. Such advice frequently had its origin within the electric industry, which was keen to sell more and a greater variety of electric lighting to American consumers. Women's clubs reporter, Myra Nye, for example reported in the *Los Angeles Times* in 1932 of a demonstration of new electric lighting techniques recently given by George M. Rankin, director of lighting for the Southern California Edison Company.<sup>357</sup> The demonstration, presented to a Soroptimist group, illustrated how colored lights were used in retail window displays to “enhance the richness of drapes and gowns.” Rankin proposed that with some attention and adaptation these same techniques could be equally effective in beautifying the home. Using a wax figure Rankin demonstrated how various combinations of colored electric light could “change the color of the hair and complexion, as well as the contours of a person's face.”<sup>358</sup> These techniques were not quite as novel as Rankin claimed however, yet given the newsworthiness of his demonstration, one can infer that they were still far from commonly used in residential interiors. A few years earlier the *Los Angeles Times* had published an article promoting “electrical cosmetics”—which sounded very similar to the applications Rankin would later demonstrate—suggesting that they were among the “new and startling innovations [used] to embellish reigning beauties on the screen.”<sup>359</sup> Describing the new electric lamp technologies making “electric cosmetics” possible, the newspaper reported:

Lights of different quality, each lending a different photographic value to the complexion on which they are thrown, through a series of ‘baby spotlights’ and

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<sup>357</sup> Brief biographical notes for Rankin can be found in his obituary, see: “George M. Rankin, Utility Chief, Dies,” *Los Angeles Times*, November 10, 1949, A9.

<sup>358</sup> Rankin concluded his presentation with the striking statement that, “light plays an important part in the scheme of beauty because 87 percent of all mental impression are gained through the eyes.” Myra Nye, “Club Notes,” *Los Angeles Times*, February 17, 1932, A7.

<sup>359</sup> “Begone, Ye Paint, Powder! Make-up by Light has Come,” *The Los Angeles Times*, June 12, 1927, 28.

‘pin lights’ which project narrow beams directed at the desired place on a subject’s face, do the work.<sup>360</sup>

The shading, highlights, and contouring described in the article—effects typically produced by applied cosmetics—were instead produced by the carefully directed beams of red, blue and violet lighting. However, this luminous form of make-up was really only effective when translated and reproduced through a black and white negative. As the article revealed, the electric cosmetics had been developed for use on Hollywood stars being photographed.<sup>361</sup>

### **World War II: Maintaining Morale in the Home**

The potential adaption and development of electric lighting applications tailored to enhance the domestic environment and personal beauty was put on hold during the nation’s involvement in World War II. Wartime material restrictions and the disruption of the gendered organization of American society—which cut across work, home, and family—shifted popular discourse away from such concerns, with greater emphasis falling upon personal restraint and contribution to the war effort. That said, consideration of color and electric light as a means of maintaining the aesthetic and emotional experience of the American home continued unabated during the war, in no small part due to the relentless efforts of the electric industry.

When the United States instituted blackouts as a defensive (and largely symbolic) measure, it was precisely color and light that was called upon to maintain “cheer” within the nation’s homes.<sup>362</sup> The *Washington Post* reported in 1941 that government mandated blackouts did not “mean that homes will be without cheer.”<sup>363</sup> Rather, as the *Post* argued,

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<sup>360</sup> In “Begone, Ye Paint, Powder!,” 28.

<sup>361</sup> *Ibid.*, 28.

<sup>362</sup> On blackouts in the United States during the World War II see Sandy Isenstadt, “Groping in the Dark: The Scotopic Space of Blackouts,” *Senses & Society* v.7, n.3 (2012): 309-328.

<sup>363</sup> Martha Ellyn, “Home Cheer Need Not Bow out to Blackouts,” *The Washington Post*, December 15, 1941, 13.

preserving the quality of “home sweet home” was more important than ever during blackouts, urging readers to utilize a combination of color and electric light within the domestic interior to help “maintain civilian morale.” In the article, *Post* Household Editor, Martha Ellyn interviewed the American decorator Bertha Schaefer, who described the value of color and lighting in maintaining a harmonious and peaceful domestic scene:

Too few homemakers realize that the lighting of the home may be a strong factor in soothing irritations, and in keeping a balance between conflicting personalities. By that I mean creating a setting of unfailing harmony and peace. And I feel that just now such effort may be a real morale builder.<sup>364</sup>

Rather than stressing the harmony or unity of the interior aesthetically in terms of the ambitions of modernism—as so prominent in the sources examined in Chapter 2—Schaefer focused on the need to address and harmoniously reconcile different personalities through color and lighting. Offering comment on one of Schaefer’s recent projects, Ellyn praised her use of pleasing “soft tones” in the lighting of the interior, describing them as “flattering to complexions and any costumes worn.”<sup>365</sup>

Achieving such harmonious effects however required an experienced eye and an unsentimental attitude, Schaefer warned. Echoing attitudes long dominant in women’s advice literature the author insisted that many women were unaware of the appropriate colors for their personality type. As evidence of this persistent issue, Schaefer claimed that she often found herself in the uncomfortable position of upsetting “a woman’s preconceived idea of what her home should suggest” by proposing she adopt a different background, “one that is flattering to her type.”<sup>366</sup> While the thrust of the article is largely one of maintaining civilian spirits and standards within the home during wartime, the focus on personality, color, and lighting is consistent with the pre-war period.

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<sup>364</sup> Ellyn, “Home Cheer Need Not Bow out to Blackouts,” 13.

<sup>365</sup> Ibid. See for example the discussion of new stagecraft theories regarding the use of light in scenic design and the integration of such approaches into the design of modern interiors in Chapter 2, “Invisible Mechanisms of Modernism,” 87-99.

<sup>366</sup> Ellyn, 13.

As the war came to a close and the United States geared up to enter an unprecedented period of economic growth, these notions would provide both continuity with the gendered beliefs and practices operative during the interwar period, as well as a foundation upon which industry would build a greatly expanded landscape of consumer choice, one in which electric light held a prominent role. As American society returned to its consumer-centrism, the electric industry developed a raft of marketing strategies especially calibrated for greatest appeal to women.

### **Starting at Home: Nurturing a Nation of Consumers**

In anticipation of the end of World War II, American industry began to prepare for the shift from war production to the development and expansion of the consumer goods market. American government and industry leaders recognized an opportunity for successful postwar reconversion through the cultivation and expansion of the nation's consumer economy.<sup>367</sup> To prime postwar economy, three principal areas of focus were established within the nation's recovery plan—investment in new home construction, endorsement of consumer credit, and the renewed emphasis on the role of women as purchaser consumers in the domestic maintenance and management of the home.

This economic strategy positioned the home as the center of the American family and the prime context for consumer activity, and the United States government supported various initiatives to ensure that the single-family home was within reach of as many Americans as possible. Fueled by the financial incentives of Veterans Administration benefits and the Federal Housing Administration's support of the mortgage market, new home construction skyrocketed after the war. Within two decades of the end of the war approximately 60

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<sup>367</sup> On this period see, Cohen, *A Consumers' Republic* in particular chapter 3, "Reconversion: The Emergence of the Consumers' Republic," 111-192.

percent of Americans owned their own homes, compared with only 44 percent in 1940.<sup>368</sup>

Deeply implicated in the promotion of homeownership in the United States was the central role of women as homemakers and prime decision makers in household consumption. While many women had taken up paid labor during the war, with the influx of returning unemployed soldiers American women were encouraged to return to domestic duties.

Although many continued to work outside the home, certainly within middle-class white suburban society the role of wife-mother-homemaker was held up as a cultural ideal.<sup>369</sup> As design historian Penny Sparke has argued, in the postwar period women were:

Armed with the skills of household management, new labour-saving appliances, new affluence and consumption possibilities, and with the help of expert professional academics in the fields of sociology, psychology and psychoanalysis, keeping house and bringing up children was no longer considered a drudgery but rather a combination of pleasures and a set of professional tasks and challenges. With unfulfilling work seemingly banished forever, the housewife could concentrate on becoming a nurturant, a beautifier, and a consumer, roles which were seen to reflect women's essential differences from men.<sup>370</sup>

The decision to leave paid labor for unpaid domestic work in the home therefore, was not seen as sacrificing a professional career, but rather as joining the front line in the battle to nourish and protect the American way of life. Indeed, raising and maintaining the standard of living was central to the nation's strategy for seeding postwar prosperity. As Cohen has illustrated, across government, industry, business, labor organizations, and popular media the overriding message in the postwar era was that "mass consumption was not a personal indulgence, but rather a civic responsibility designed to provide...improved living standards for the rest of the nation."<sup>371</sup> Within such an economic ethos, the spending of each consumer—in this sense very much couched as a citizen consumer—contributed to increased

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<sup>368</sup> Cohen, *A Consumers' Republic*, 122-123.

<sup>369</sup> See Meyerowitz, *Not Jule Cleaver*.

<sup>370</sup> Sparke, *So Long as it is Pink*, 166; and Cohen, *A Consumers' Republic*, 111-129.

<sup>371</sup> Cohen, *A Consumers' Republic*, 113.



production, the creation of more jobs, and the realization of more affluent individuals “capable of stoking the economy with their purchases.”<sup>372</sup>

The fervor with which government and industry promoted consumer activity in the postwar era, further intensified attention on women and the home as key elements in the prosperity cycle. Industry-led marketing activities likewise targeted the home as a source and site of consumer activity as never before. By definition this was and continued to be a gendered environment and discourse. As it had been historically, the home was largely understood as the woman’s environment and responsibility—whether she worked within or outside it. Despite many women seeking work outside of the domestic context during the war, their intrinsic cultural connection to this environment was ever-present. Women participating in the war effort were reminded of the place awaiting them within the home. In a number of advertisements that ran during the war years, lighting products in production for the military were promoted as indicative of promising lighting solutions for the postwar home. A striking advertisement for Sylvania lighting products for example, features two paired photographs; one a picture of a woman dressed in workers’ clothing, standing on the factory floor and looking thoughtfully, even maternally, at an industrial fixture she holds in her hand; just below, there is a smaller inset image of the same woman, now in feminine day wear, standing in a homey kitchen steadily holding a domesticated version of the Sylvania fluorescent lamp in her hands and gaze. The text reads, “Note to homeowners: This means something to you, too. It foretells the day—not now, but after Victory—when you will have efficient fluorescent lighting in your own home.”<sup>373</sup> While the emphasis in this and other

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<sup>372</sup> Lizabeth Cohen, “A Consumers’ Republic: The Politics of Mass Consumption in Postwar America,” *Journal of Consumer Research* vol.31 (June 2004): 236-239.

<sup>373</sup> Sylvania Electrical Products Inc., advertisement, in *New Pencil Points* v.24, n.9 (September 1943): 26. See also, Sylvania Electrical Products Inc., advertisement, “Designed for Lighting—Today and Tomorrow,” in *New Pencil Points* v.24, n.7 (July 1943): 77; Sylvania Electrical Products Inc., advertisement, “Age Before Duty,” in *New Pencil Points* v.24, n.8 (August 1943): 105; Alcoa Aluminum advertisement, “They’ll Bring Good Lighting Home with their Pay Checks,” in *New Pencil Points* v.24, n.8 (August 1943): 91; General Electric advertisement, “Lighting Planned to Serve,” in *Pencil Points* v.25, n.12 (Dec. 1944): 2-3.

wartime advertisements for the electric industry was on improved efficiency and lighting levels, after the war marketers returned to the more traditional feminine enticements of beauty, charm, and personality and the concomitant responsibilities and demands of maintaining the American standard of living in the home.

### **Designed for and by Women: Lighting the Postwar Home**

Such industry generated messages were absorbed and disseminated quickly through popular advice literature. Mary Roche, *New York Times* Home Editor, reported in 1947: “If there is any one invention that promises to make our homes of tomorrow radically different from our homes of yesterday that one is modern lighting.”<sup>374</sup> She continued, suggesting, “most people are likely to think of better light as more light—for reading, for darning socks, for getting a better look in the mirror.” Roche scolded such ideas as “old-fashioned,” proposing that it was the overall quality of light, rather than quantity, that made the contemporary interior attractive. The best kind of light according to Roche, was indirect, diffused illumination—and in this respect she demonstrated a closer connection to prewar discussions of electric lighting in terms of its architectural, rather than gendered context. However, Roche quickly fell back upon well-worn tropes, suggesting lighting a room with indirect illumination alone, was not sufficient, advising: “A room with nothing but indirect lighting would look as flat as an anemic blonde with no make-up.” Suggesting means to mitigate such an unflattering interior pallor, Roche proposed that homemakers “balance local lighting with general, direct with indirect, in a way that will enhance the room and its contents, highlight the lines of furniture, accent the colors.”<sup>375</sup> Here, very much as in the interwar period, is the familiar correspondence between the cultivation and maintenance of personal beauty and the attractiveness of the interior. Roche’s likening of a poorly lit room to a woman without make-

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<sup>374</sup> Mary Roche, “Lighting to Accent Line and Color,” *The New York Times*, December 2, 1945, SM18.

<sup>375</sup> *Ibid.*

up, suggests the persistent conflation of women and domestic environment, cosmetics and personality, beauty and lighting.

Throughout the postwar period women were urged to integrate lighting into domestic décor across a variety of sources including popular home and garden columns, shelter and fashion magazines, residential lighting demonstrations, and lighting industry spokeswomen. Roche's article neatly summarizes the variety of means with which the electric industry delivered its messages to women consumers. In addition to prophesizing the transformative power of light for the "home of tomorrow," Roche reported on a range of domestic lighting related items, including: new electric lighting applications, the innovative electric lighting in Wanamaker's "Home of Vision" in Philadelphia, the Illuminating Engineering Society's new residential lighting guidebook, and General Electric's *Light for Living* recipes.<sup>376</sup> Roche's column was not an exception. As Americans looked ahead promisingly following the war, it would seem electric lighting was everywhere on the horizon. Inundated with information and promotional materials about electric lighting for the home, women in particular were of great interest to the lighting industry and its marketers. Electric lighting was no longer a utility belonging exclusively to engineers and builders; it was a decorator's aid and an agile beautifier equally effective for furnishings, people, and interiors. Furthermore, illuminating engineering and lighting consultation was no longer the exclusive domain of men. The electric industry increasingly sought women lighting experts to advise on domestic lighting applications and marketing strategies, as will be discussed further below.

By the late 1940s electric lighting was gaining recognition as an important consideration in the decoration of the home, and as such was quickly developing its own body of literature. As the journal of lighting industry's leading professional organization, *Illuminating Engineering* noted with some enthusiasm in 1947: "books on home

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<sup>376</sup> Ibid.

decoration...are showing an interesting trend toward greater attention to the lighting of a room and its relation to the decoration."<sup>377</sup> The journal pointed to four recently published decorating manuals that included individual chapters devoted solely to electric lighting in the home, one book that had two chapters, and an additional book that treated lighting in every chapter. *Illuminating Engineering* also reported that 1947 marked the Encyclopedia Britannica's first inclusion of a full-page plate on electric lighting with material provided by Myrtle Fahsbender, chairman of the Illuminating Engineering Society's Committee on Residence Lighting and director of residential lighting for the Westinghouse Lamp Division.<sup>378</sup>

Fahsbender held particularly high profile roles within the lighting industry and the illuminating engineering community during the postwar period, but her presence and influence within a historically male-dominated industry was undoubtedly eased by increasing recognition of the importance of female consumers for continued growth in the sector. This was much more than a passive awareness of the valuable contribution that women could make to the postwar campaign to sell more lighting to American residential consumers. In the mid-1940s regional utilities, electric lamp and lighting manufacturers, and other lighting industry organizations actively recruited women to help promote more extensive use of electric lighting in the home. By the late 1940s, General Electric, Sylvania Electric and Westinghouse all employed female home lighting specialists, who conducted research and led a variety of outreach events, working with homemakers and decorators to increase awareness of the potential of electric lighting in improving the efficiency in daily tasks, beautifying and decorating interiors, and increasing overall livability of the domestic environment.

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<sup>377</sup> "Lighting Chapters in Books on Decoration," *Illuminating Engineering* (U.S.) n.6 (Jun. 1947): 604-605.

<sup>378</sup> "Lighting Chapters in Books on Decoration," 603.

The central role of women advisors and specialists in the electric industry's efforts to expand the residential market for electric light is evident in another article by Mary Roche for the *New York Times* from 1949. Reporting on a recent convention of the Illuminating Engineering Society, Roche described how,

Terms like footcandle, test area, calibrations, and visibility level were tossed around in scientific profusion at the recent National Technical Conference...If an uninitiated householder had wandered into one or two of the sessions, he might have been pardoned for not realizing that all this weighty talk was aimed at enhancing the comfort and pleasure of his evenings at home.<sup>379</sup>

While the proposed "uninitiated householder" theoretically caught off guard by the currency of scientific terms and recommendations at the convention was male (and in his post-work, at home guise), it is clear in reading Roche's report that many of the participants in the conference were women working within the industry. Calling special attention to some female lighting specialists who presented at the event, Roche praised their demystification of engineers' jargon and suggestions for new residential lighting techniques and applications. Aileen Page, a lighting specialist from General Electric at the conference, employed concepts and terms more common to domestic advice literature than the typical illuminating engineering paper, informing the audience that, "Rooms lighted according to today's recommended practice have a subtle atmosphere and 'feeling' about them which no camera lens can capture."<sup>380</sup> Roche reiterated Page's statement in her column, emphasizing the intuitive appreciation of such emotive conditions produced by new electric lighting applications, suggesting that such a response could not, "be calibrated by means of statistical curves or set forth in a scientific tabulation."<sup>381</sup> Tacit within Roche's commentary was the notion that beyond the science of illumination was the aesthetic experience of electric light, which was most accurately measured in the pleasurable enjoyment of the environment so

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<sup>379</sup> Mary Roche, "Lighting for Comfort," *New York Times*, October 2, 1949, SM44.

<sup>380</sup> Roche, "Lighting for Comfort."

<sup>381</sup> *Ibid.*

illuminated. Such tensions as Roche noted, between the measuring of footcandles and the aesthetic expression and experience of light were very much characteristic of the professional discourse within the discipline from its formulation in the early years of the century right through the postwar period. The nature of these debates and their development over the course of the first half of the twentieth century will form a key area of focus in Chapter 4.<sup>382</sup>

Other residential lighting specialists at the conference similarly presented on potential uses of electric lighting in the decoration of the domestic interior. Jan Reynolds, a home lighting consultant for Sylvania Electric, spoke on color and lighting in the home with the “decorator consultant,” Gladys Miller, while Mary Dodds of the Toledo Edison Company presented two papers with General Electric’s E. W. Commery—one proposing new applications to improve lighting conditions while watching television, and the other describing lighting strategies for playing and practicing the piano at home.”<sup>383</sup> Fahsbender and Priscilla Presbery, also of Westinghouse, offered a paper on improving visual comfort and acuity for sewing with specialized lighting applications.

Summarizing the diverse presentations, Roche suggested that while the papers “were discussed by an impressive number of experts,” in the final analysis, each of them came “to simple conclusions which even a bride might understand.”<sup>384</sup> With this, Roche firmly located the benefit of the knowledge shared at the conference in the hands of women, and moreover, not just any woman, a bride—a homemaker in embryonic form. This was, in essence, also the overriding strategy of the lighting industry’s residential marketing campaign in the postwar era. Using clear, familiar language and concepts, the industry set about empowering women consumers to adopt modern lighting applications as part of their management of the home. With applications designed to facilitate and improve domestic maintenance, increase

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<sup>382</sup> See, Chapter 4, “The Science and Art of Lighting,” 217-230.

<sup>383</sup> Roche, “Lighting for Comfort.”

<sup>384</sup> Ibid.

the efficiency of household labor and enjoyment of leisure activities, as well as to beautify and enrich their interiors and themselves, the industry tailored electric light to a vast range of women's domestic concerns. Reaching out to women not just as purchaser consumers (albeit with the clear of aim of converting more female customers), the creation of home service departments within many of the nation's utility companies provided women with new opportunities for engaging in the development and promotion of residential electric lighting to American homemakers. On this point historian Carolyn Goldstein has argued that women, particularly those trained as home economists, "were well positioned to help utility companies interpret electricity to consumers while projecting a friendly corporate image."<sup>385</sup> This training allowed them to communicate consumer needs to electrical engineers readily and likewise to convincingly present the engineered advantages of new technologies to homemakers.

Fahsbender, as one of the most prominent women working within the electric industry, used her position also to advocate for bringing more women into the industry, encouraging women to educate themselves as lighting specialists.<sup>386</sup> In an interview with *The Christian Science Monitor* in 1946, Fahsbender claimed, "because of women's natural preoccupation with the home...they are especially qualified to become lighting consultants." Not only were they inherently suited to the task, she argued, but women had good reason to acquire these skills. According to Fahsbender:

For years, people have built beautiful homes, carefully selecting just the right furnishing and accessories to harmonize...but none of these things can be fully

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<sup>385</sup> Goldstein characterizes the working relationship between such women consultants for industry and the engineers responsible for new product and application development as a partnership, one wherein women offered close knowledge of "the need for certain refinements which will mean added convenience to the user." Goldstein, 133.

<sup>386</sup> Among the more prominent women working as residential lighting consultants were Fahsbender and Presbrey at Westinghouse, Aileen Page at General Electric, Jan Reynolds at Sylvania, and Mary Dodds at the Toledo Edison Company. See Mary Roche, "Lighting for Comfort," *New York Times*, October 2, 1949, SM44.

appreciated at night. When the lights are turned on, because the lighting has not been planned as part of the decorative scheme, much of the loveliness is lost.<sup>387</sup>

Similarly the *Chicago Daily Tribune* warned its readers that “a living room, full of charm by day, can lose its appeal at night with the flick of a switch if its lighting is not right for it.”<sup>388</sup>

With the loss of daytime charm at stake at nightfall, thoughtful planning of illumination for the home was in such advice literature, a requirement for conscientious homemakers. When electric lighting in the home was “used properly,” the *Tribune* reported, “it enhances colors and give a relaxing effect to the living area.”<sup>389</sup>

In both of these articles, and many others of a similar nature, American homemakers were reminded of the potentially disastrous aesthetic and social effects of inadequate or inappropriate electric lighting on both the quality of life at home and the attractiveness of the domestic environment and its inhabitants. Such tactics were consistently paired with enticements, such as the promise of enriched colors, harmonization of furniture groupings, renewed charm, more peaceful family relations, and enhanced personal beauty—all achieved through integrated (and extensive) electric lighting. Typical of such rhetoric, the *Los Angeles Times* advised its readers that,

Fixtures and lamps should not only increase visibility but also create mood and atmosphere, adding to the pleasure and satisfaction in homemaking. With proper lighting, rooms seem larger, colors appear richer, and furnishings—yes, and people—look more attractive.<sup>390</sup>

Such statements also tied the illuminating planning and use of electric light in the home to the gendered discourse of self-fulfillment and satisfaction realizable through homemaking—

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<sup>387</sup> Helen Henley, “Miss Fahsbender Spotlights New Field for Women in Home Illumination: Westinghouse Pioneer Insists Decorating Includes Lighting,” *The Christian Science Monitor*, April 11, 1946), 16. Myrtle Fahsbender began her career in 1929 as a secretary for the Chicago Lighting Institute, advancing through the organization to serve as a home lighting consultant. She then joined the Westinghouse Lamp Division in 1936 where she became a prominent spokeswoman for residential lighting—giving lectures across the country, writing numerous articles, both for magazines and trade publications, and contributing to educational booklets, as well as working on new fixture designs and lighting applications.

<sup>388</sup> “Poor Lighting can Rob Room of Its Charm,” *Chicago Daily Tribune*, September 16, 1951, W\_C15.

<sup>389</sup> “Poor Lighting can Rob Room of Its Charm.”

<sup>390</sup> “Lighting Plays Important Role in Decorative Scheme of Home,” *Los Angeles Times*, October 6, 1957, K10.



notions that postwar American feminists, such as Betty Friedan, would famously challenge less than a decade later.<sup>391</sup> Just as a woman was to take pleasure in the preparation of her toilette—scrutinizing her own reflection while seated at the dressing table, finding social confidence and pride in her perfected image—in her duties as a homemaker, electric lighting was to serve a similar role as that of cosmetics, allowing her to refine and perfect her environment. Well planned electric lighting, as was suggested in a variety of sources, ensured a more attractive and personalized backdrop for daily activities, a more pleasing environment for entertaining guests, and greater ease and efficiency in household maintenance and labor—all of which contributed to increased self-satisfaction and social acceptance for the homemaker.

### **Light Conditioning the Postwar American Home**

Throughout the 1930s and right up to the war, all the major United States electrical manufacturers had employed some variation of the “Better Light – Better Sight” marketing campaign first introduced by G.E.’s Matthew Luckiesh. The campaign used a variety of tactics, from promoting the research findings of industry laboratories to popular anecdotal evidence, to bolster claims of improved sight with the use of higher light levels and more tailored task lighting. Also stressing the importance of reducing glare while increasing the intensity of illumination, the campaign promised substantial improvements in worker performance and visual acuity in the office, factory, school and home.<sup>392</sup> Shifting emphasis away the connection between modern electric lighting and improved sight, in the later 1940s the industry increasingly focused their efforts on marketing and promoting the qualitative,

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<sup>391</sup> Betty Friedan, *The Feminine Mystique* (New York: W.W. Norton & Company, [1963] 2001). On the social rhetoric and pressures of Cold War “domestic containment” in the U.S., see Elain Tyler May, *Homeward Bound: American Families in the Cold War Era* (New York: Perseus Books, 1988).

<sup>392</sup> See for example, Claire Winslow, “‘Better Light, Better Sight’, is New Slogan,” *Chicago Daily Tribune*, September 29, 1935, C5, or “Eyesight Aids for Building More Popular: Painting and Decorating Stressed as Important to Lighting,” *The Washington Post*, September 8, 1935, R11.

lifestyle benefits of electric light. As *Barron's* reported in 1958 looking back over changes in the lighting industry during the preceding decade:

Traditionally, the appeal has been to 'save your sight' by buying more bulbs. Whatever its effect on lamp sales, this approach did little or nothing to spur demand for fixtures. In recent years however, G.E. has changed its pitch. Good lighting, the company has discovered, can be sold as an adjunct to interior decoration far more readily than as a sight-saver.<sup>393</sup>

Armed with a new approach especially tailored to the lifestyle conscious postwar consumer, leading electrical manufacturers commenced upon a direct and purposeful campaign to expand the domestic market for electric lighting.<sup>394</sup> The competitive pressure on even the biggest of American companies to establish and maintain market share was significant, as General Electric's president, Charles E. Wilson candidly described in 1947 for *The Wall Street Journal*: "We're not kidding ourselves. The fight for business in the period ahead will be more rugged than anything we've been in up to now."<sup>395</sup> He further suggested that the company's production of consumer lighting products would be greatly expanded in order to "bring into balance for the first time G.E.'s consumer and industrial business." In the hopes of gaining advantage in the booming postwar consumer goods market, companies like Westinghouse, Sylvania, and G.E. focused on the all-important American way of life, positioning abundant electric lighting as an essential condition of modern living. G.E. might

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<sup>393</sup> David A. Loehwing, "Bright Prospects: The Makers of Lighting Fixtures Look for Continued Growth," *Barron's National Business and Financial Weekly* v.38, n.6, February 10, 1958, 5.

<sup>394</sup> As early as 1944 General Electric began marketing to the (soon to be) postwar consumer. In a campaign appearing in *Pencil Points*, G.E. advertised the "Whole House as a Lighting Fixture!" Calling upon Nathaniel Owings, of Skidmore, Owings & Merrill as a spokesperson, who suggested, "For the home of the future, even in the \$5000 class, we have a structural concept of lighting. Ultimately the surfaces on which light falls tend to determine lighting. Therefore, why not start with that and design a house as a lighting fixture?" Appearing in a leading architectural journal it is not surprising that the emphasis is on incorporating light as a structural rather than decorative element. As such, the language is more that of the architect (male) than decorator (female). General Electric Advertisement, "The Whole House as a Lighting Fixture," in *Pencil Points* v.25, n.7 (July 1944): 28-29.

<sup>395</sup> Joseph Guilfoyle, "General Electric Co., Is Six Industries in One; Makes 200,000 Products," *The Wall Street Journal*, April 14, 1947, 1.

as well having been speaking on the behalf of the industry when they claimed, “We are no longer just selling light bulbs; we are selling luminous environment.”<sup>396</sup>

Entering the postwar market, G.E. led its promotional efforts with its new Light Conditioning program, all but replacing the former Better Light – Better Sight campaign. Announced in the November 1950 issue of G.E. Lamp Department’s journal, *The Magazine of Light*, this “great crusade” aimed to “light condition” no less than 40,000,000 American homes. As H.H. Green, director of the Market Development department at Nela Park, prophesized, “It’s only the beginning but never has any lighting program had a greater or more worthy objective and never has any program begun so auspiciously.”<sup>397</sup> More pointedly, *Magazine of Light* editors reported that the Light Conditioning program was to be “carried out with the cooperation of virtually the entire electrical industry,” and represented “by far the biggest, most far-reaching and most important residence lighting project in the history of the Lamp Department.”<sup>398</sup> Looking to harness the popularity of demonstration houses in the postwar era as a means of introducing consumers to the program and demonstrating the lifestyle benefits of increased electric lighting in the home, G.E. called for 10,000 light-conditioned demonstration homes to be built across the country by the end of 1951. According to G.E.’s research, this represented one demonstration home for every 400 residential electric meters. It is revealing that the basis of their statistical analysis would be electric meters rather than homeowners, reinforcing the primary objective to sell more light and electricity.

Although sustained expansion of the consumer market for electric light was the primary objective of the Light Conditioning program, the industry put much effort into reaching out to

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<sup>396</sup> David Loehwing, “Spreading Light: The Electrical Industry Finds Rewards in Vanquishing Darkness,” *Barron’s National Business and Financial Weekly* 36, 24, June 11, 1956, 3; quote from Donald L. Millham, General Manager, Lamp Division of General Electric.

<sup>397</sup> H.H. Green, “This is it!” *The Magazine of Light*, General Lamp Department, General Electric, vol. 19, no. 4 (Nov., 1950): 8.

<sup>398</sup> *The Magazine of Light*, General Lamp Department, General Electric, vol. 19, no. 4 (Nov., 1950): 3, 7.

and engaging with their target audience on familiar terms while addressing common domestic concerns. Organized around a set of lighting “recipes” created by E. W. Commery, head of the Residential Lighting Section of General Electric’s Engineering Division at Nela Park, the Light Conditioning program sought to speak directly to builders, retailers, and perhaps most importantly, homemakers. As Commery explained:

The uniform set of recipes creates a new power in the whole field of household merchandising. No unusual training is required to learn them. The buyer and the seller, all the way down the line from the manufacturer to the consumer will benefit. One simple program can aid in the direction of home lighting practice at both the manufacturing and consuming levels simultaneously. This unanimity of telling the lighting story has never been as extensively developed before at the market level.<sup>399</sup>

The cover of this special issue of the *Magazine of Light* captured the spirit of the campaign and the proposed lifestyle benefits of Light Conditioning for the postwar consumer. The image of a young blonde woman dominates the cover. Holding a handful of Light Conditioning recipe cards, her married status indicated by the slim gold band on her left hand, the idealized image of the housewife beams. The excitement of her blue eyes is transposed to an artful array of electric light bulbs forming a graphic pattern behind her. The recipe cards read: dining, make up, reading in bed, writing, sewing, ironing, and television viewing. In this one image, G.E. summarized the potential of Light Conditioning to attract and sustain the attention of American women as purchaser consumers. The program promised a broad sweep of lifestyle improvements to homemakers—making domestic chores both more efficient and more pleasurable—just by following a group of simple recipes that could be easily held in one hand.

Accompanying the launch of the program, G.E. published a small booklet cataloguing a host of Light Conditioning recipes, entitled, “See Your Home in a New Light.” Leaving no

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<sup>399</sup> E. W. Commery, “New Concept in Home Lighting,” *The Magazine of Light*, General Lamp Department, General Electric, vol. 19, no. 4 (Nov., 1950): 9-18.

room un-conditioned, the booklet systematically addressed “the extent and location of all the important places which need to be lighted in any home” with task specific recipes. The 38-page booklet, which was distributed to over 14 million readers by the mid-1950s, included recommended reflectance levels for ceilings, walls, and floors in all of the major rooms of the house, further suggesting appropriate footcandle measurements for a diversity of daily tasks. It also offered an overview of numerous possible fixtures, diffusers, bulb types, and other individual lighting products and accessories, as well as a host of task-specific lighting recommendations.<sup>400</sup> The program aimed to encourage DIY residential lighting with seemingly straight-forward “recipes” for specify lighting in the home. The Light Conditioning recipes were based on research conducted by the Residential Lighting Committee of the Illuminating Engineering Society (IES), which Commery also directed and chaired. The uniform recipes were proposed as equally suited to guiding “skilled specialists” as homemakers in the “hundreds of thousands of homes which the skilled specialist can never meet or serve.”<sup>401</sup> G.E. Residential Lighting Specialist, Kaye Leighton, further emphasized the importance of placing detailed, easy to understand guidelines in the hands of consumers and at the point of purchase, arguing that, “By adhering to the recipe specification the home owner is now able to evaluate lighting equipment when in the dealers’ showrooms.” This point, Leighton explained, “was one of the deciding factors in keeping the Light Conditioning Recipe Booklet compactly written and small in size, so that it might easily be carried in pocket or purse.”<sup>402</sup>

In addition to playing to such pragmatic concerns as ensuring good lighting for everyday domestic tasks and activities, G.E. also drew upon and developed connections

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<sup>400</sup> General Electric Company, Lamp Division, *See Your Home in a New Light: Tested Light-conditioning Recipes that Create Light for Living*, 4th edition (Cleveland, Ohio: The Company, 1955).

<sup>401</sup> E. W. Commery, “The Story Behind General Electric’s New Concept in Home Lighting,” *The Magazine of Light*, General Lamp Department, General Electric, vol. 19, no. 4 (Nov., 1950): 9-11; quote on pg. 9.

<sup>402</sup> Kaye Leighton, “Lighting Recipes are for Existing Homes, too,” *The Magazine of Light*, General Lamp Department, General Electric, vol. 20, no. 2 (May, 1951): 24-31, quote on pg. 30.

between electric lighting and the psychological conditions within the American home and family. Such rhetoric can be easily identified in a full-page color advertisement for Light Conditioning that accompanied the launch of the program in the November 1950 issue of the *Magazine of Light*. Headed with the slogan, “You’ll live in a house where the sun never sets,” the advertising copy below inquired, “How would you like to spend all of your life on the sunny side of the street?”<sup>403</sup> A large color illustration echoed this notion: a sunset, richly colored in gold, orange and twilight purple on the distant hills tells a classic American story. A young boy running towards home with his dog raises his arm to wave to a woman—his mother, one imagines—standing in the central picture window of a ranch house peacefully settled into the landscape. The house is luminous, radiating warmth and suggesting the security and harmony of this domestic idyll.

Underscoring the tranquility of this domestic scene, the promotional text of the advertisement prompted readers to consider the broader benefits of Light Conditioning. Promising a “home where no dark shadows lurk. Where gloom is unknown,” G.E. argued that modern electric lighting offered both control and protection, providing for a home environment “Where darkness never comes—except by invitation.” Pushing this metaphor further, the advertisement emphasized the psychological benefits of electric lighting, suggesting further that the Light Conditioned home was one in which “the sun never sets—to shrink your horizons, to dim your eye, to weight your soul.”<sup>404</sup> G.E. was not only offering better residential electric lighting conditions, but moreover an eradication of doubt, depression, and anxiety. Light Conditioning then was a far more holistic and ambitious program than its predecessor, not just offering a strategy for improved residential illumination, but also the means with which to control the visual, aesthetic, and psychological

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<sup>403</sup> General electric advertisement, frontispiece, *The Magazine of Light*, General Lamp Department, General Electric, vol. 19, no. 4 (Nov., 1950).

<sup>404</sup> Advertisement, *The Magazine of Light* (Nov., 1950).

conditions of the home. Underscoring the sweeping scope and aims of the program, *The Magazine of Light* described Light Conditioning not so much as an entirely new program, but rather as a refinement of prewar efforts, suggesting once again, the unflagging nature with which G.E. and the electric industry pursued American consumers. With great optimism and confidence the editors again linked the ethos of the citizen consumer with the marketplace power of the purchasing consumer, proposing that the Light Conditioning program would ensure the “continuation of the electrical progress of the nation,” and as such, that in “the immediate and future potentialities of home lighting” the nation would find “the greatest single opportunity to serve the greatest number of people.”<sup>405</sup>

### **Demonstration Homes and Consumer Outreach**

Encouraging owners of existing homes to revamp their domestic lighting plan with Light Conditioning recipes was only one aspect of the ambitious industry-wide program. Equally important in the postwar era was the booming residential construction market.<sup>406</sup> With targeted marketing outreach initiatives, such as G.E.’s 1952 education program for Long Island builders, it is clear that the company well understood the power of numbers. A detailed account of the Long Island campaign published in *The Magazine of Light*, described G.E.’s strategic infiltration of the region’s flourishing suburban residential construction market. The nine-page feature begins with a tantalizing overview of Long Island’s competitive speculative home market:

There are many who agree that a number of home building trends are born on Long Island...where a seemingly limitless number of new residential communities comprising anywhere from 100 to 1000 or more homes appear

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<sup>405</sup> “10,000 Light Conditioned Homes Will Carry Recipes to the Public,” *The Magazine of Light*, General Lamp Department, General Electric, vol. 19, no. 4 (Nov., 1950): 6-7.

<sup>406</sup> On postwar suburban housing developments, like those featured in the G.E. project see, Barbara M. Kelly, *Expanding the American Dream Building and Rebuilding Levittown* (New York: SUNY Press, 1993).

month after month, year after year...with each builder attempting to outdo all the others in giving the public more for its money.<sup>407</sup>

Having identified fertile soil, G.E. focused on converting builders to the “Light Conditioning story,” a demographic, it was reasoned, that could use these lighting strategies as a marketplace point of difference attractive to buyers:

The builder is without doubt the key man. Hundreds of manufacturers of equipment besiege him with reasons why he should adopt their products...the builder makes the decision. His success depends upon his ability to know in advance what the prospective home buyer will think of his selection and arrangement of equipment.<sup>408</sup>

Collaborating with Central Queens Electric Supply, a Long Island electrical equipment provider, G.E. invited nineteen of the company’s best residential construction clients to fly to Nela Park for a one-day education and training seminar—an extravagant and apparently persuasive measure. After arriving at G.E.’s research campus, the participants were given a series of Light Conditioning and “visual planning” demonstrations organized by Commery. According to participant accounts reproduced in the article, the program was received very positively (although it would be surprising if anything less than flattering feedback was published in G.E.’s own magazine). Morris Weinberger, a partner in the Long Island housing development Seaford Oaks, wrote to the seminar organizers to thank them for the experience, describing how it had changed his approach to his business. Enthusiastically he wrote, “I am not trying to sell houses today; I am selling lighting, and the response from the home buying public is sensational.”<sup>409</sup>

Offering evidence of how the Light Conditioning message was further disseminated throughout the residential construction industry, the article included testimonials from

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<sup>407</sup> “Look to Long Island,” *The Magazine of Light*, General Lamp Department, General Electric, vol. 21, no. 2 (May, 1952): 10-22, quote on 10.

<sup>408</sup> “Look to Long Island,” 11.

<sup>409</sup> *Ibid.*, 19



architects and decorators working with the builders who had been to Nela Park. Long Island

Decorator Peggy MacIntyre described how:

Light conditioning seems to help everybody. In bringing out the colors and textures of fabric and furniture, it is an aid to the decorator, and a sales help to the speculative builder; but most of all, it makes the home a more pleasant place for the family who lives in it.<sup>410</sup>

Having decorated a demonstration home following Light Conditioning recommendations, MacIntyre reported that she found the new lighting applications were not only good for the builder's sales, but for her business as well, claiming:

Since people have seen the demonstration home there, we have been called upon to do many additional decorating jobs in which lighting plays an important role...Light conditioning, in an unobtrusive way, makes a good decorating job look better. The importance of "seeing" whether for appreciation of beauty, or for the better performance of household tasks, is finally being established.<sup>411</sup>

From her perspective as a decorator, it is not surprising that MacIntyre would list the "appreciation of beauty" before "the performance of household tasks" in her summary of the benefits of light conditioning. However, MacIntyre's emphasis on the importance of electric light as an overall visual enhancer and beautifier for the home is also characteristic of much of the industry's marketing rhetoric in this period—most acutely found in marketing materials and efforts targeting women consumers specifically. In the second half of the 1950s the benefits of electric lighting in terms of beautifying the home were repeatedly linked to positive emotional responses, such as happiness, for the homemaker as well as the other members of the household. As one of the new owners of a Light Conditioned Long Island house remarked, the lighting made "the whole house more cheerful...putting an end to gloomy days."<sup>412</sup> Such anecdotal commentary reinforced the G.E.'s claim that, "Light

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<sup>410</sup> Ibid., 17.

<sup>411</sup> Ibid., 21.

<sup>412</sup> Ibid., 18.

conditioning makes daily living more enjoyable. You can use it to set the stage for the way you want to live, to look, to feel.”<sup>413</sup>

Within seven months of the launch of the Lighting Conditioning program, success was measurable and widespread within the residential market, at least according to G.E.’s research, which claimed of the 144 participating electric utility companies, 74 (51%) had made plans for a Home Light Conditioning activity; 116 (80%) had either distributed or planned to distribute the *See Your Home in a New Light* recipe booklet; 53 (37%) had sponsored or were planning to sponsor Light Conditioned demonstration homes; and 53 (37%) had plans for “follow up merchandising activities.”<sup>414</sup>

### **Light for Living: Selling the All-Electric Lifestyle**

Despite such unfettered enthusiasm for the Light Conditioning program at the outset of the 1950s, by mid-decade the electric industry was rebranding its message under the Light for Living banner. With increased emphasis on a host of lifestyle benefits possible with a wider variety of domestic lighting applications, the Light for Living campaign exemplified the industry’s efforts to continue to grow demand for electric lighting within the residential market. Developed in tandem with the Live Better Electrically program, both campaigns were consolidated under the ambitious “Medallion Home” program in 1956 with initial financial assistance provided by General Electric and Westinghouse and the collective support and participation of 180 electrical manufacturers and 300 utility companies across the country.<sup>415</sup> Again appealing to builders as the means through which to access consumers, the

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<sup>413</sup> *See Your Home in a New Light*, 7.

<sup>414</sup> Kaye Leighton, “Lighting Recipes are for Existing Homes, too,” *The Magazine of Light*, General Lamp Department, General Electric, vol. 20, no. 2 (May, 1951): 24-31.

<sup>415</sup> The program received much attention in the popular media in the years following its launch, see for example, “Country-wide Support Given to New Program,” *Los Angeles Times*, June 1, 1958, F7. The Medallion Home program, while supported industry-wide, was initiated with sponsorship from General Electric and Westinghouse in March of 1956. A great deal of useful information and ephemera regarding the program can be

Medallion Home program awarded houses meeting specified standards of “electrical excellence” a special medallion “to be affixed permanently” to the home’s facade.<sup>416</sup> To obtain a Gold Medallion required that a builder or homeowner demonstrate “full house power,” which included all major electrical appliances, electrical heating, and adherence to Light for Living recommendations (which were essentially the same guidelines as set out in the Light Conditioning program).<sup>417</sup> The program incentivized the inclusion of more electrical appliances and lighting applications for builders, promising a significant market advantage for houses displaying a Medallion. Unlike previous marketing programs that assumed homebuyers would intuitively recognize the value added by electric lighting, the Medallion Home program made it explicit and easily recognizable even before entering the home. As the *Los Angeles Times* reported, the program enabled “prospective purchasers to tell at a glance that [a house] meets the highest standards of lighting, wiring, and electrical equipment.”<sup>418</sup>

Across the county, regional and national newspapers featured stories on the Medallion Home program, many giving particular attention to the lifestyle improvements associated with the extensive electrification and illumination required for Medallion certification.<sup>419</sup> Surely informed by industry publicity agents, the articles typically contained detailed descriptions of the many novel lighting applications in Medallion houses. One such article, “The Right Light? This Home’s Got 35 of ‘em!” appearing in the *Chicago Daily Tribune*, offered a comprehensive report on the number and types of lighting featured in the Gold Medallion. Built by developer Leonard W. Besinger & Associates, the model home was

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found on the website of the Washington State Department of Archaeology and Historic Preservation, <http://www.dahp.wa.gov/live-better-electrically-the-gold-medallion-electric-home-campaign>

<sup>416</sup> “Country-wide Support Given to New Program.”

<sup>417</sup> Advertisement, “Gold Medallion Home!” *The Hartford Courant* (Sept. 20, 1959): 9F.

<sup>418</sup> “Country-wide Support Given to New Program.”

<sup>419</sup> See, “These Recipes are Different,” *The Washington Post*, September 8, 1956, H29; “Homes on Display Top 1958 Lighting Standards,” *The Hartford Courant*, September 21, 1958, 10C; “The Right Light? This Home’s Got 35 of ‘em!” *Chicago Daily Tribune*, March 21, 1959, W\_A2.

exhibited at the Chicago World Flower and Garden Show in the spring of 1959.<sup>420</sup> With the assistance of residential lighting experts from Commonwealth Edison, the General Electric Company, and the Chicago Lighting Institute, Besinger managed to incorporate nearly triple the number of lighting fixtures typically utilized in a contemporary single family home.<sup>421</sup> Dubiously, Ted Cox, managing director of the American Home Lighting Institute claimed exponential and quantitative gains as a result of the increased number of lighting applications in the demonstration house, suggesting, “This home’s lighting is 200 percent better than today’s average home.”

In another article published in *The Hartford Courant*, Cox argued that prior to the Medallion Home program, “buyers didn’t know whether a house provided the lighting needed for comfort, safety and beauty.”<sup>422</sup> While the first two benefits Cox listed—comfort and safety—had long been a mainstay of the electric industry’s messaging, inclusion of “beauty” in the lighting requirements of the average American home, called upon even older and specifically gendered beliefs and practices regarding the homemaker as much as the home, as have been discussed. However what is most compelling in the postwar period is the way in which the discourse on beauty and gender was integrated into industry campaigns, like the Medallion Home program, suggesting growing confidence within the industry of the presence and influence of women as purchaser consumers. Addressing the Chicago section of the Illuminating Engineering Society, Fahsbender revealed the enthusiasm within industry to further develop this sector of the market, suggesting the profession was entering a period of “endless possibilities” for decorative uses of electric light in the home. Demonstrating a variety of new lamp types and dimmer systems, Fahsbender offered examples of lighting for

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<sup>420</sup> “The Right Light?”

<sup>421</sup> The national standard in 1958 was the national standard of 12.2 lights per residence, as quoted in “The Right Light?”

<sup>422</sup> “Homes on Display.”

“purely decorative purposes” and how such electric lighting could “furnish a room with drama and beauty.”<sup>423</sup>

In addition to increased emphasis on the use of electric light for decorative purposes, the second half of the 1950s also saw the industry ramp up rhetoric regarding the psychological or emotive benefits of modern electric illumination. Calling upon long-established, gendered beliefs that located responsibility for the emotional and physical well-being of the family with women, the electric industry astutely refashioned such assumptions within their postwar marketing efforts, cleverly linking decorative enhancements and happier households with the use of more electric lighting in the home. Interviewing Cox regarding the latest recommendations of the American Home Lighting Institute for *The Washington Post*, Henry Bechtold reported that the institute had found improved residential lighting contributed to a more positive emotional environment within the home. Bechtold advised readers: “If you’re nervous and tired lately, or depressed about the appearance of the house, it could be that the lighting arrangements in your home need a new touch.”<sup>424</sup> While such claims were not new, the scale of both the rhetoric and the recommendations was unprecedented. Referencing American Home Lighting Institute Standards, Cox described how to utilize and modify the electric lighting in the home to fulfill a broad sweep of any homemaker’s domestic responsibilities, including: creating rooms that radiate “beauty and hospitality,” bringing to life “the color, design and texture of home furnishings” while also guarding “against nervousness and fatigue” and providing “emotional stimulation for gay parties or rest.”<sup>425</sup>

Similarly pursuing the connection between the decorative and psychological benefits of modernized electric lighting, an article appearing in the *Los Angeles Times* emphasized the

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<sup>423</sup> “Lighting Steps Forward with Modern Décor,” *Chicago Daily Tribune*, April 14, 1957, N\_A8.

<sup>424</sup> Henry Bechtold, “Institute Hopes to Lead Homes Back to the Light,” *The Washington Post*, July 25, 1959, B14.

<sup>425</sup> Bechtold, B14.

importance of controls in managing both aspects in the daily maintenance of the home. Pointing to another light-based technology as having recently galvanized the home as the nucleus of the family, the article reiterated the notion that electric light could mediate the emotional atmosphere of the home: “In this television age, when the home is once again the center of family life, lighting design is the most effective method of fitting the mood of the home to the mood of the activity.”<sup>426</sup> The article, it is worth noting, appeared in the home section of the paper alongside other stories on such topics as the role of color in home decoration, the use of mural wallpapers, and the labor-saving benefits of electrical appliances, and was written to appeal to the interests and concerns of its women readers. Given the similarity of the language used in this article, as well as the claims made about the expanded role of electric light in the decoration and maintenance of the home, it is clear that such messages were being consistently targeted at women consumers by the industry in this period.

While industry’s marketing efforts geared to builders and residential developers tended to focus on the marketplace appeal of a well-lit house, their messages were tailored for women consumers by appealing to expectations and social anxieties regarding their roles as homemakers, wives, mothers and hostesses. Approaching the postwar residential market from all sides, the industry strove to build demand by generating desire. For women, the message of both creating and controlling beauty and drama in the domestic interior through the manipulation of electric lighting could not have been easily missed. With the flexibility provided by a variety of dimmers and new lighting applications especially designed for the residential environment, homemakers could manipulate the domestic setting, acting as cinematographers for setting each scene as required or desired. This analogy is not as far fetched as it may sound, as in the postwar period Hollywood stars and cinematographers also

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<sup>426</sup> “Lighting Plays Important Role in Decorative Scheme of Home,” *Los Angeles Times*, October 6, 1957, K10.

entered into the discourse on residential lighting, adapting the tricks of the trade to the domestic interior, and offering women the possibility of recreating the beauty and glamor of the big screen in their own homes.

### **Day and Night, Ladies, Watch Your Light**

Actively promoting of the use of electric light as a highly effective visual enhancer, Hollywood continued to lend its influence to the electric industry during the postwar period. As had been the tradition since at least the 1920s, Hollywood's film stars and artists frequently served as authorities on beauty in popular media. The *Chicago Daily Tribune*, for example, featured an article in 1951 by actress and beauty columnist Arlene Dahl, who reported on a recent interview with MGM cinematographer John Alton on the use of electric light as a beauty aid. Invoking familiar criticism of women unable or unknowingly presenting themselves in an unflattering way, the cinematographer told Dahl, "Women worry me...They go to all sorts of trouble dressing and putting on make-up, then ruin the whole effect with bad lighting."<sup>427</sup> With the conviction of a man who had spent many hours behind the camera, Alton stressed that beauty, literally, is in the eye of the beholder, insisting: "It's too bad women today don't realize that light can be a great factor in personal beauty. Too often we think of it merely in connection with seeing, not with being *seen*." Echoing popular interwar advice regarding the dressing table, women's cosmetics, and the importance of seeing oneself as others would, Alton identified light as the agent of vision, releasing the "look" from the image reflected in the mirror and locating it in the projection and reflection of electric light.

Empowering women to control the ambiguity of "being seen", Alton described how a woman might anticipate a response to potential onlookers with the greatest possible beautifying benefit by utilizing electric lighting as a cinematographer would. To make his

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<sup>427</sup> Arlene Dahl, "Lighting is a Factor in Beauty, Says Hollywood Cameraman," *Chicago Daily Tribune*, December 5, 1951, B7.

point, Alton focused his advice first on the most intimate of spaces, the bedroom. Referencing his work in the popular movie *An American in Paris* (1951), he provocatively explained how a woman could achieve similarly luminous and seductive effects as those in the film's romantic ballet scene with Gene Kelly and Leslie Caron. To create this soft, rosy lighting in the bedroom, Alton recommended the homemaker use a "pink or peach translucent shade on her boudoir lamp." To further personalize the lighting, Alton instructed the woman who would prefer to "emphasize the beauty of her figure rather than her face" to use indirect lighting on the walls, so that she would be "silhouetted as she moves about the room."<sup>428</sup> Moving on to the dining room, another room with romantic potential, Alton decried the continued use of harsh overhead lighting, adding that it "adds years to the age of everyone seated under it." Suggesting a simple and effective solution, Alton advised reader to replace the typical central ceiling downlight with indirect lighting, thereby allowing the reflected light to "smooth away wrinkles and beautify every face with a soft, diffused glow."<sup>429</sup> Unlike much of the contemporary advice on electric lighting within the decorative scheme of the home, Alton prioritized the homemaker's appearance rather than her décor. By placing the homemaker's beauty and attractiveness as the first consideration, Alton gave her a similar pride of place in the total composition of the domestic scene, just as he did for the stars in the movies he lit. Proposing essentially that women be their own cinematographers, Alton described how they could approach their interiors as if scenes from Hollywood films, manipulating light to create the mood they desired (in the bedroom nonetheless!) and to best accentuate their personal beauty assets.

Dahl's interview with Alton also served to promote the cinematographer's recently published book, *Painting with Light*—with which the pair posed for the newspaper, photographed shoulder to shoulder, holding its cover towards the camera and reading from its

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<sup>428</sup> Dahl, "Lighting is a Factor in Beauty."

<sup>429</sup> Ibid.



pages together with knowing interest. Ostensibly a handbook for amateur photographers, it comprehensively described the principal modes and techniques of photographic lighting common in Hollywood cinematography of the period, including “mystery lighting”, atmospheric lighting, lighting for close ups, outdoor photography, “visual music”, and even a chapter on television and the “human camera.”<sup>430</sup> The twelfth chapter entitled, “Day and Night, Ladies, Watch Your Light,” however is an anomaly even within the book’s wide-ranging overview of cinematographic techniques.<sup>431</sup> The only section of the book specifically addressing and addressed to women—not as photographers, but as women, who one can infer, were defined by their desire to better control and enhance their appearance—this unusual chapter offered “ladies” tips on how to utilize artificial lighting to their best advantage as well as cautionary tales describing what would happen if they did not.<sup>432</sup>

Asserting a fundamental feminine entitlement (and implicit responsibility), Alton began: “Every woman has the right to be as beautiful as she possibly can.” Yet despite this gender-born privilege, Alton pondered why women would pay such close attention to “dress styles, cosmetics, make-up, hairdos, permanent waves, and other beautifying means,” yet give so little thought to lighting. Employing the narrative equivalent of looking the reader in the eye, he then asked, “how many of you ladies have ever tried to use light as a beautifier?”<sup>433</sup> Without lessening his grip on his female readers, Alton called out the faulty logic of focusing on the individual details of one’s appearance without considering the total image, imploring readers: “What good are the new dress, the perfect make-up, the hairdo if, when you go out, the lighting in which you appear simply kills them?” Claiming that most women remained oblivious to the effects of light, he suggested that all too often women’s

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<sup>430</sup> John Alton, *Painting with Light* (New York: MacMillan, 1949; repr., Los Angeles: University of California Press, 1995), 172.

<sup>431</sup> *Ibid.*, 171-184.

<sup>432</sup> *Ibid.*

<sup>433</sup> *Ibid.*, 171.

efforts at beauty were foiled by “murderous illumination,” with some women even falling prey to bad lighting, unwittingly finding themselves “slowly illumurdered.”<sup>434</sup>

Proposing that while little had been done to “beautilluminate the individual,” Alton indicated hopefully that women could find inspiration in recent advancements in “home illumination for decorative purposes.”<sup>435</sup> To assist women in the development of personal “beautillumination” strategies, Alton outlined four primary typologies of beautifying light for women: “*sparklight*” to light and animate the face, “*beauty light*” to illuminate the hair, “*lovelight*” to make the eyes shine brightly, and “*glamour light*”, which he described as “indirect, almost no light; it is soft, and no matter where it comes from, will do the face no harm.”<sup>436</sup> The provocative language Alton employed here and throughout the chapter suggested a psychologically intimidating dichotomy of effects; at one end of the spectrum a woman was threatened with being “illumurdered” and at the other, with being done “no harm” in “beautillumination.” Further intensifying the delivery of his advice, Alton addressed women in the first person, repeatedly suggesting that any and every woman could appear beautiful if only the right combination of lighting techniques were employed. He repeatedly promised that a woman’s beauty, when properly illuminated, would open doors of opportunity—whether for a desired job or man.<sup>437</sup> Illustrating this point, Alton recounted a story about a young woman who had come to Hollywood with the hope of becoming a movie actress. However, performing poorly on her first screen test, the frustrated starlet eventually had to take a job as a secretary for a film studio executive. Just as her dreams of fame and fortune seeming all but dashed, Alton describes how the young secretary’s fate suddenly

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<sup>434</sup> Ibid., 171. Given such striking prose, it is not surprising that Alton’s fame as a cinematographer was largely built upon his work in the film noir genre. He was responsible for the dark and brooding cinematography of such classic noir films as *T-Men*, *Raw Deal*, *He Walked by Night*, *Border Incident*, and *The Big Combo*. See Todd McCarthy’s introduction to the reprint of Alton’s original text. McCarthy, “Through a Lens Darkly: The Life and Films of John Alton,” in Alton, *Painting with Light*, ix-xxxiv.

<sup>435</sup> Alton, 171.

<sup>436</sup> Ibid., 174.

<sup>437</sup> Ibid., 176-177.

changed: “One morning a camera man happened to pass by her office and noticed that in a certain light she looked just beautiful.” The unnamed camera man, who one imagines was Alton, helped her move her desk in front of the window, facing the door, so that as people entered the office she would “take advantage of that light.”<sup>438</sup> The next morning, as sunlight streamed in behind the young woman illuminating her blonde hair and reflecting off the walls in front of her, softly brightening her face with indirect light, her boss arrived and saw her anew. “From then on everything changed, and for the better,” Alton wrote. Sounding not unlike a contemporary Hollywood fan magazine, he concluded with an aphorism: “Love at first sight is love at first light.”<sup>439</sup>

Promising the glamor and magic of the big screen to any woman willing to experiment with her lighting, Alton again reinforced the connection between beauty (or at least appearing beautiful) and achieving social acceptance and personal affirmation for women. Extending this logic to the domestic environment, sounding very much like contemporary electric industry rhetoric, he advised readers: “Whenever possible, see to it that you are in the right light, and look your best. By properly distributing lights in your home, surrounded by well-lighted happy people, you can make it a pleasant place in which to live.”<sup>440</sup>

### **Making Home Lighting a Consumer Product**

Ensuring that such messages were not forgotten, a few years later Arlene Dahl again praised the beautifying effects of electric light in her syndicated column “Let’s be Beautiful.”<sup>441</sup> Following the now predictable format, Dahl claimed that while it was recognized that lighting could “do a lot toward making or breaking a beauty reputation,” she chastised

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<sup>438</sup> Ibid., 172-173.

<sup>439</sup> Ibid., 173.

<sup>440</sup> Ibid., 173.

<sup>441</sup> Arlene Dahl, “Simple Tricks of Lighting in Home will Help to Enhance Your Beauty,” *Chicago Daily Tribune*, August. 3, 1955, A1.

women who continued to “ignore this factor completely.”<sup>442</sup> Appealing to the commonsense of her readers, Dahl proposed that the best place to achieve the full aesthetic benefits of electric illumination was in the home, where a woman would have the most control of her lighting. Recalling Post’s popular notion of creating a flattering backdrop for oneself, family and guests, Dahl suggested, “The quality [of light] in your living room should be warm to flatter your complexion and that of your guests.”<sup>443</sup> To achieve such an ideal condition, Dahl instructed women to consider wall colors first. If the colors were beige, pink, or otherwise warm and soft, the lighting should be nearly perfect without further effort. However if the walls were painted gray or white, then warm toned lampshades were likely to offer the best effect, she advised. In addition to these established approaches, Dahl, somewhat breathlessly, then shared a recent discovery—the introduction of a new pink-toned light incandescent bulb with exceptionally flattering effects. She wrote, “It’s amazing how your complexion—and indeed your whole room—gets a beauty boost when you use these bulbs instead of ordinary white ones.”<sup>444</sup>

Whether she was hoping to preserve her journalistic integrity or was miming the tone of the era’s gossip columnists, Dahl resisted naming the manufacturer of the new pink bulbs, indicating only that they had been developed by a “major electric company.” However, the new pink bulbs Dahl praised, as well as a family of similar pastel colored bulbs introduced at this time, were hardly a secret and indeed, would garner much attention in the media during the second half of the 1950s. Furthermore, the marketing and promotion of these bulbs synthesized and coalesced a number of key concerns and responsibilities implicit in popular discourses on female beauty, the decoration of the domestic interior, and providing for the emotional needs of the family, through offering a simple, affordable ceramic coated solution.

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<sup>442</sup> Dahl, “Simple Tricks of Lighting.”

<sup>443</sup> Ibid.

<sup>444</sup> Ibid.

One of the more commonly cited problems in selling modern lighting to postwar consumers was the complexity of applications and the many elements necessary to realize a complete interior illumination scheme. While it was a straightforward marketing task to sell electric washing machines, dryers, dishwashers, and other domestic appliances, residential lighting was a complicated system of parts that could not be so easily wrapped up and sold as a self-contained unit to American consumers. While the industry invested much effort in convincing builders and developers to include extensive lighting applications in new residential constructions and demonstration houses, not all bought the Light Conditioning story. Furthermore, although new home construction reached record levels in the postwar period, many families and individuals lived in apartments or older houses with limited wiring and capacity for the new electric lighting standards being advocated by groups such as the American Home Lighting Institute. This problem was amplified by increasing emphasis on indirect lighting as the best and most flattering background for any interior—an ideal that was reiterated in industry marketing efforts that associated such modern lighting conditions with the American standard of living. Many of the indirect lighting applications recommended in the home pages of national newspapers and more specialized journals suggested the integration of lighting fixtures into architectural features, custom built masking devices, and specialized reflectors. Such background lighting, however pleasant, did not obviate the need for additional localized task and accent lighting. As a final level of complexity, in addition to indirect, localized, and task lighting, there still remained the selection of control systems including dimmers and switches.

“New Life with New Light!” a feature appearing in *The American Home*, is exemplary of such recommendations, encouraging readers to transform their living spaces and upgrade their lifestyle with modern electric lighting.<sup>445</sup> The article suggested such improvements as

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<sup>445</sup> “New Life with New Light!” *The American Home* no.6 (May 1949): 98.

recessed lighting in bookshelves, accent lighting for the china display cabinet, niche lighting adjustable with dimmers for a “shadow box” above the fireplace, and recessed cove lighting along the cornice of the room. One can easily imagine this would have been a daunting challenge for the average homemaker with limited knowledge of the standards and requirements of such electric lighting installations. However, the article makes no suggestion of consulting a specialist, an extra step and cost that would have placed the realization of such “new life” beyond the reach of average middle class consumers. Calling attention to the difficulty in bridging the gap between industry recommendations and feasible lighting solutions for the majority of Americans, *The Washington Post* reported in 1956, “it is obviously impossible to arrive at a single lighting formula that can be applied to all situations.”<sup>446</sup>

In suggesting such a diversity of electric lighting applications, tailored to different room types, decorative schemes, tasks, and occasions, electrical lighting manufacturers and utility suppliers, unwittingly perhaps, made it increasingly difficult for consumers to identify electric lighting as a product. As has been illustrated, lighting manufacturers and regional utility providers worked collectively to simplify their messages, collaborating on a variety of educational marketing and outreach campaigns such as Light Conditioning and Light for Living, offering consumers a limited range of recommendations for the most common lighting challenges in the home. Presented as lighting recipes, thereby invoking familiar tasks and rituals for the homemaker, these programs aimed to naturalize electric lighting technology, while colonizing its integration into daily domestic life.<sup>447</sup> However these recipes and recommendations generalized residential lighting far more than they simplified it. Therefore, while the prospect of beautifying one’s home and self, while also increasing one’s pleasure and satisfaction in the day to day maintenance and management of the home was

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<sup>446</sup> “These Recipes are Different,” *The Washington Post*, September 8, 1956, H29.

<sup>447</sup> “These Recipes are Different,” H29.

doubtlessly attractive to American homemakers, in reality it was a far more difficult aspiration to achieve than painting the walls, reupholstering the sofa, or trialing a new shade of lipstick.

### **Light Bulbs that Flatter: A Single Colorful Solution**

As a promising alternative to the complexity and confusion of modern residential lighting, the new pastel colored incandescent bulbs about which Dahl expressed such enthusiasm, suggested that any woman, regardless of prior experience with electric lighting, could select a bulb with luminous characteristics flattering to both her décor and complexion. Furthermore, once chosen, the homemaker could easily install the bulb into any standard lighting fixture. Advertisements and press coverage stressed the diffuse, softly colored lighting the bulbs produced without the need for integrated architectural coves, special lighting niches or other masking devices; as the promotional copy suggested, they were just simple bulbs that could be easily switched if no longer pleasing or if a change was desired.

The “Softlight” incandescent bulb, introduced by Sylvania Electric in early 1955, was one of the first of these products specially designed to “flatter home furnishings and occupants.”<sup>448</sup> Coated with a pastel ceramic finish, it produced a softer light than conventional frosted blubs and promised the additional benefit of altering the appearance of colors within its spectral reach. Sylvania’s Softlight bulb was purported to make yellow look orange, blue appear soft gray, and according to the *Wall Street Journal*, it gave a “warmer, deeper tone to orange and beige colors.”<sup>449</sup> Six months later, the *New York Times* similarly reported that the new Softlight bulb cast “a mellow glow, without a pinkish cast,” able to provide equally flattering effects for “complexions, wood grains of furniture and colors of

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<sup>448</sup> “A Bulb that Flatters,” *The Wall Street Journal*, January 27, 1955, 7.

<sup>449</sup> “A Bulb that Flatters.”

fabrics.”<sup>450</sup> The *Times* also promoted the bulb’s capacity to produce “indirect lighting without special fixtures.”<sup>451</sup> Directly on the heels of Sylvania, General Electric released its “Glamour Pink” bulb in September of 1955.<sup>452</sup> Promoted nationwide, *The Hartford Courant* reported that the pink enamel coated bulb would “enrich warm colors in fabrics and add luster to polished furniture,” and furthermore, that it promised to “do more for a woman’s complexion than any lighting device since the candle.”<sup>453</sup> A photograph that accompanied the *Courant* column featured an attractive, smiling young woman holding a selection of illuminated Glamour Pink bulbs, her face glowing warmly as if by candlelight.

In August of the following year, Westinghouse Electric expanded the concept, introducing its “Beauty Tone” line—a full suite of pastel tinted light bulbs. Like Sylvania’s Softlight and G.E.’s Glamour Pink bulbs, the Beauty Tone family was marketed with emphasis on the decorative and beauty-enhancing effects of the new colored bulbs. As the *Chicago Daily Tribune* announced: “The new ‘beauty tone’ bulbs can be used to refresh, intensify, lighten, or subtly alter existing textures and colors and can offer special flattery to the complexion.”<sup>454</sup> Betting on the “phenomenal acceptance” of the previously launched tinted light bulbs, Westinghouse introduced two additional colors with the Beauty Tone line, Candlelight—designed to flatter yellows, yellow-reds, and yellow-greens, and Aqua—designed to provide “an atmosphere of coolness” complementary to blues and blue greens.<sup>455</sup> As General manager of Westinghouse’s lamp division, F. M. Sloan described for the *Tribune*:

The various tinted light bulbs can be used to cool or warm a room or a corner, to express taste and personality, to create a special atmosphere for an evening or a season, or to recast a color scheme to accommodate new purchases or a change in furniture arrangement.<sup>456</sup>

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<sup>450</sup> “Lamps Light at the Touch of a Finger,” *New York Times*, August 18, 1955, 18.

<sup>451</sup> “Lamps Light at the Touch of a Finger.”

<sup>452</sup> “Firms Develop Light Bulb in ‘Glamor’ Pink,” *Chicago Daily Tribune*, Sept. 4, 1955, WA.

<sup>453</sup> Photo Standalone 20, no title, *The Hartford Courant*, September 11, 1955, B12.

<sup>454</sup> “Pastel Tints are Developed in Light Bulbs,” *Chicago Daily Tribune*, August 19, 1956, N\_A4.

<sup>455</sup> Ibid.

<sup>456</sup> Ibid.



One month after Westinghouse released its extended product line of colored bulbs, General Electric introduced the “Coloramic” family in four shades: Dawn Pink, Sky Blue, Sun Gold, and Spring Green. G.E. launched the new product line with an extraordinary media blitz, running a series of fashionable, full color, full-page advertisements in nationally distributed magazines, as well as sponsoring television advertisements that aired during the primetime family show, *Cheyenne*, seen by roughly twenty-seven million viewers in 1957.<sup>457</sup> A 1957 Coloramic advertisement appearing in *Look* was typical of G.E.’s marketing campaign for the new suite of colored bulbs. Enticing readers to “Give your home four ‘new looks’ with new General Electric Coloramic Bulbs” the advertisement prominently displayed the four pastel colored bulbs in a series along the top quarter of the vertically-oriented full-page advertisement.<sup>458</sup> Below appeared a photograph of a stylish modern living room divided into four sections, each corresponding in hue to the specific Coloramic bulb above. The individual sections illustrated the dramatic effects of the colored light on the décor of the room. Beneath the photograph were descriptions of the characteristics and benefits of each bulb, which not surprisingly included: making rooms look larger, warmer, and more intimate; enhancing and brightening colors; and flattering textiles and complexions. In addition to enhancing the appearance of the room, its objects and inhabitants, the advertisement promised that Coloramic bulbs could also produce a range of desirable and lively atmospheric effects from

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<sup>457</sup> In promotional materials intended for retail vendors, General Electric described the broad advertising campaign planned for Coloramic bulbs for the 1956-57 selling season. G.E. promised national magazine advertising, including such titles as *Better Homes & Gardens*, *American Home*, *Life*, and *Look*; television advertising during *Cheyenne*; as well as substantial retail merchandizing support including special color display units for use in retail environments. G.E. also promised increased profits for retailers through higher pricing on the new colored bulbs. See, General Electric marketing materials, “Look What’s Behind Coloramic Bulbs,” ca. Sept. 1956. Regarding the significance of the television advertisements, Lynn Spigel’s describes the rapid infiltration of this new media into American homes and families in her cultural history of television in the United States, *Make Room for Television*. She argues that in the years following World War II Americans purchased televisions at unprecedented rates—more rapidly than they had purchased any other form of home entertainment. Between 1948 and 1955 televisions were installed in approximately two-thirds of the nation’s homes. See Lyn Spigel, *Make Room for Television: Television and the Family Ideal in Postwar America* (Chicago: University of Chicago Press, 1992).

<sup>458</sup> General Electric Advertisement, “Give Your Home Four New Looks,” appearing in *Look*, October 29, 1957, 72.

added “charm” to a “‘party’ look” for special occasions<sup>459</sup> Also carrying the Live Better Electrically logo, the advertisement associated the Coloramic product family with the electric industry’s larger lifestyle campaign.

Another Coloramic advertisement appearing in *Life* magazine the same year offered a very similar message but with simplified imagery and wording. In this instance instead of a living room displayed in four iterations of Coloramic hues, it featured a cropped close-up of an attractive married woman—evidenced by her wedding ring—holding the four pastel bulbs lightly in her manicured hands.<sup>460</sup> With the banner heading, “Decorate with G-E bulbs—\$1.16 a room,” in the text accompanying the image of the woman and her bouquet of bulbs, emphasis was given to the affordability and ease of decorating with Coloramic products. Reminding readers that “only G.E.” offered consumers four “exciting colors,” women were urged to take advantage of Coloramic’s variety and to “buy ‘em four at a time in distinctively colored cartons.”<sup>461</sup> With a final stroke of marketing flourish, the advertisement suggested that rather than selecting one particular color to enhance a room, that women should “bulbsnatch”— a neologism describing the practice of swapping one colored bulb for another to provide different decorative effects to suit one’s mood, freshen the look of a room, or enhance one’s complexion.<sup>462</sup>

### **The Power of Color: Consumer Attraction, Selection, and Satisfaction**

The marketing of colored incandescent light bulbs, in addition to engaging with traditional interior decoration considerations, also capitalized on the intense interest in color as a

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<sup>459</sup> Ibid.

<sup>460</sup> General Electric Advertisement, “Decorate with G-E bulbs--\$1.16 a room,” *Life*, January 21, 1957, inside front cover.

<sup>461</sup> “Decorate with G-E bulbs--\$1.16 a room.”

<sup>462</sup> Ibid.

consumer lifestyle choice and as a personalizing agent in the postwar period.<sup>463</sup> While color had long been a focal point of interest and concern for women in terms of personal beauty, interior decoration, and the expression of personality, perhaps in no previous era had color received such widespread attention or popular exploitation as it did in the 1950s. Fueling both interest and investment in color for marketing and styling, Howard Ketcham, a leading color consultant to American industry from the late 1930s through the postwar period, published the highly accessible handbook, *Color Planning for Business and Industry* in 1958. In the book's nineteen chapters, Ketcham itemizes the many uses and benefits of color in everything from display windows, to cosmetics, to advertising to product design. Recapping the nearly unparalleled scope of color's importance and influence in the book's introduction, Ketcham posited,

So significant is the correct use and application of color today that it supplies an excellent earmark for the progressive, modern company. It often reveals whether a company is well-managed, well acquainted with the problems of modern merchandizing and well equipped to face competition.<sup>464</sup>

For Ketcham and other postwar color consultants, modern design and effective marketing was unthinkable without careful attention to color. A common topic in the popular media as well, Kay Barrington, reporting for *The Washington Post* in 1951 informed readers of swelling interest in color across industry and among the public. Advising readers on the advantages of knowing how to use color, Barrington claimed: "Colors can sell goods for manufacturers. They can make lives safer in a workshop. Color can actually change your life."<sup>465</sup> Interviewing Faber Birren, one of nation's most prominent industrial color

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<sup>463</sup> See Howard Ketcham, *Color Planning for Business and Industry* (New York: Harper & Brothers, 1958), 2. For the continued role of color in home decoration see also, Frances Lee, "When You Choose Your Living Room Palette, Make Sure the Colors Merge Into a Flattering Background for You," *The Washington Post*, November 11, 1956, AW30. See also, Blaszczyk, *The Color Revolution*.

<sup>464</sup> Whether you look to women's etiquette guidebooks, beauty advice, or home decoration manuals from the nineteenth century forward color is a primary concern. Women were expected to employ their 'natural' feminine capabilities to coordinate the colors of their interior with their attire and complexion.

<sup>465</sup> Kay Barrington, "Color Can, and Does, Change Your Life," *The Washington Post*, July 22, 1951, S10.

consultants, Barrington recounted his belief in the benefits of color for both the home and workplace. Birren proposed the greatest advantage afforded by the skillful use of color was increased consumer attraction, selection, and satisfaction: “We buy food when it looks appetizing, clothes when they are becoming, and we insist that our homes be attractive and livable. Color is often the determining factor in what we select and what we reject.”<sup>466</sup>

Two years later James Nagle, reporting for the *New York Times* on recent news from nation’s marketing and advertising industry, informed readers:

The influence of color in everything from supermarkets and plane and ship interiors to shirts and fountain pens is assuming greater importance yearly. The trend is expected to be accelerated in the consumer goods field as the country moves into an expanding buyers’ market.”<sup>467</sup>

Offering readers background on trend towards color, Nagle interviewed Ketcham, who argued that the introduction of color televisions was a major factor in the increasing use and importance of color in the marketing of products. Explaining that the expanded role of color was particularly notable in the decorating, apparel, and home furnishing sectors, Ketcham indicated that marketers in these areas, who were already employing color advertisements in national magazine campaigns, were now preparing to promote their products “in full color on the screen.”<sup>468</sup> The race among manufacturers to reach television audiences with color advertisements was driven by the belief that their products would be “far more effectively demonstrated in ‘wanted’ colors.” Ketcham warned however, that the lighting for television, “somewhat like that in supermarkets, tends to play tricks with colors,” advising that products and packaging should be designed with consideration for their “TV appearance.”

In addition to considering how color would translate to the television screen, Ketcham further advised manufacturers and marketers to consider the use of color to give a “distinctive

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<sup>466</sup> Ibid.

<sup>467</sup> James Nagle, “News of the Advertising and Marketing Fields,” *New York Times*, August 23, 1953, F8.

<sup>468</sup> Ibid.

character” to specific products. Reading closely, it would seem that Ketcham meant gender specificity more than “character” with this particular recommendation, proposing gender associative colors for products intended primarily for either men or women. For example cosmetics were to be packaged in “soft feminine colors,” while razorblades were to be wrapped in “more masculine hues.”<sup>469</sup> Given such prominent support for gender-cued colors, it is not surprising that General Electric would first approach the market with its ceramic coated incandescent bulbs in Glamour Pink or that Westinghouse would respond with “candlelight” and “aqua”. The names of the electric industry’s pastel-colored products resonated semantically with commonly held notions of female attractors: romance, beauty, and leisure. Rather than invoking quantifiable conditions of colored electric light, industry marketers associated these products in advertisements and promotional materials with emotive and sensorial effects, which it was believed held a greater power of attraction for women.<sup>470</sup> Manufacturers expected that women would identify with such distinctly feminine language and colors. Furthermore, the ability to quickly transform a look with a color change had been a primary means of expressing personality since at least the mid-1920s. The electric industry’s pastel colored light bulbs offered women consumers an affordable and nearly effortless means of personal expression. As Penny Sparke has argued, the increasing interest in color within industry in the postwar era was a “response to the expansion of feminine consumption, which demanded, or so it was perceived, an enhanced level of personalisation and aestheticisation in its products.”<sup>471</sup> Thus marketing the ease with which a woman could “bulb-snatch”, alter or enhance the entire color palette of her environment was an obviously advantageous strategy in courting the purchasing power of women consumers.

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<sup>469</sup> Nagle, F8.

<sup>470</sup> Sparke, *As Long As It's Pink*, 195-196.

<sup>471</sup> *Ibid.*, 194.

### **A Missing Color: Whiteness and the Gendered Marketing of Lighting**

While such popular discourse suggested the seemingly universal feminine appeal of colored light bulbs, the industry was clearly addressing a white, largely middle-class consumer. Although unspoken, the marketing of these domestic lighting products was unquestionably grounded in the privileged position of white culture in postwar, pre-civil rights America. The marketing of electric lighting in this period both reflected and promoted a white middle-class ideal in its language, imagery, and ideals. G.E.'s Glamour Pink bulb was widely heralded for its ability to complement women's complexions, but contrary to marketers' claims, the G.E. bulbs would not enhance every woman's complexion, as the soft pink-toned illumination would have been most noticeably flattering for Caucasian skin. Peiss has highlighted the distinct discourse on beauty within the African-American community in the United States as it developed from the later eighteenth century through to the first half of the twentieth century. Highly charged both culturally and politically, the issue of applied cosmetics and their use in relation to definitions of feminine beauty within the African-American community was quite separate from that in mainstream white culture. As Peiss maintains, "A public dialogue about the meaning of cosmetic preparations and beautifying practices accompanied the entry of black women into consumer culture. While many fashioned their appearances by following in some measure the aesthetic of European beauty, they frequently understood their beauty rituals in ways that modified, undercut, and even challenged the charges of white emulation."<sup>472</sup> In the postwar era, white Americans, and frequently, white men set the standards for feminine beauty and created a consumer culture predicated upon its continual maintenance and enhancement.

Clearly indicative of the major electrical manufacturers' desire to stake out the largest possible share of the residential lighting sector, the marketing of such products gathered

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<sup>472</sup> See "Shades of Difference" in Peiss, *Hope in a Jar*, 203-237.

together the principle decorative responsibilities of the modern homemaker and provided a simple solution, coalesced within a single pastel-tinted light bulb. For at least half a century women had been instructed through etiquette manuals, home decoration guidebooks, advice columns, and other popular literature to embody their personality type in their attire and interiors, to color coordinate and harmonize their interiors and themselves *within* these spaces, to select cosmetics that would flatter their complexions as well as the light in which they would be seen, and in all of these choices to appear attractive and charming. With the introduction of colored incandescent light bulbs, Caucasian women were promised a unified solution to these individual challenges. The soft-hued light suggested the possibility of transforming and harmonizing interior color palettes, enriching and glamorizing textiles and furnishings, providing atmosphere and charm, and most importantly, commonly beautifying the homemaker and her guests.<sup>473</sup> This message would seem not to have been lost on its target audience. Over a billion incandescent bulbs were sold in the residential market in 1955, fueled no doubt by the marketing of these specialty decorator bulbs as an adjunct to the extraordinary efforts of the electric industry to bring ever-greater amounts of electric lighting into American homes.<sup>474</sup>

### Chapter 3: Conclusion

The postwar American consumer market was a heady environment, redolent with the promise of a way of life unlike anything anyone had seen before—more of everything, and everything bigger, better, brighter, and more colorful. This lifestyle was predicated on the suburban

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<sup>473</sup> A host of newspaper and magazine articles from 1955 to 1957 promoted the use of the new tinted bulbs in the domestic environment using just such claims. For example in 1956 the *Chicago Daily Tribune* reported, “Years ago, light in the home was thought of simply as illumination. Now modern lighting also is used to achieve soft, glowing, decorator effects...Incandescent decorator bulbs diffuse light and eliminate glare...give a soft glow to fabrics and wall, and have a flattering effect on complexions.” Beulah Rodgers, “Lighting Plays New Roles in Today’s Homes: Adds Decorator Effects, Glamorizes Rooms,” *Chicago Daily Tribune*, August 12, 1956, SC. Other typical examples: “Lighting Steps Forward with Modern Décor,” *Chicago Daily Tribune*, April 14, 1957, N\_A8; and “More to a Light than Meets Eye,” *Chicago Daily Tribune*, September 22, 1957, N\_D2.

<sup>474</sup> Loehwing, “Spreading Light,” 3.

isolation of the nuclear family and the consumer-stewardship of the woman at its center. Traditional notions of family and gendered divisions of labor ballasted the nation's reconstruction efforts following World War II. With women in command of much of the household purchasing, American industry tailored its products and its messages to the female purchaser consumer. The postwar marketing of electric lighting, particularly as evidenced in the pastel-coated light bulbs of the mid-1950s, exemplifies the character and mechanisms of America's postwar consumer culture and the industry that fed it. Finding and using the "right" light was connected with personal beauty and pitched as an ephemeral, but powerful modern beauty aid and visual enhancer. Throughout the period, electric light was promoted as an agent of glamor, flattering and beautifying textiles, furniture, and people, as a means of mediating and managing the psychological conditions of the home, and as an expression of the American standard of living.

In countless advertisements, promotional items, newspapers and magazine articles, in demonstration homes and other educational outreach activities electric light was described as a uniquely adaptable and effective aid in the management and decoration of the home. Across the diversity of these sources, electric light was associated with efficient household maintenance, aiding in the homemaker's daily tasks—such as sewing, cooking, reading, dressing, all the while ensuring those within the household looked and felt better. Fashions in Living editor for *Vogue* magazine, Alison Bisgood, summarized the popular promise of electric lighting at the height of the mid-century, asking readers to imagine themselves attending a "party at which everyone is gay and sparkling, tactful and soothing, by turns—and always at the right moments: where everyone has a pleasant sense of well-being; and where all the guests, and the house itself, look their best."<sup>475</sup> The party described, she suggested was "one that every hostess dreams of giving." Suggesting that such scenes need

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<sup>475</sup> Alison Bisgood, "The Light Changes," *Vogue* 129, no. 1 (January 1957): 137-139.



not remain just a fantasy, Bisgood proposed that all any homemaker needed was electric light, a “powerful ally.” With a final flourish, Bisgood claimed, “Light—more any other single factor—determines how people feel.”<sup>476</sup> Certainly this was the message the lighting industry had been laboring to communicate for over a decade, and by all accounts this was a powerful proposition, one predicated upon the core values of American female identity and agency. More ominously, this proposition was paired with the suggestion of social ridicule if the offer was not accepted—from ruined dinner parties to disharmonious colors and familial relations to exposed age lines and beauty unrealized. Whether or not the industry’s reliance on such dialectic pairings—good/bad, harmony/discord, beautilluminate/illumurdered—resonated with women consumers is difficult to ascertain, but certainly the lighting industry’s efforts to grow the market for residential lighting continued unabated throughout the period. By 1961 half of all electric light bulbs sold in the United States were for residential use; and by 1965 over 3 billion light bulbs were being sold each year.<sup>477</sup>

While General Electric took a significant leadership role in postwar efforts to increase the consumption of electric light in American households, their campaigns were supported across the industry, including by such professional bodies as the Illuminating Engineering Society and specialized organizations, such as the American Home Lighting Institute. With such comprehensive control of the both the industry and the messages conveyed to consumers, G.E and its partners were able to keep significant pressure on residential consumers to add more and brighter electric illumination to their homes throughout the 1950s and 60s. Exemplifying the industry’s continual ratcheting up of expectations for home lighting, an article appearing in *The Hartford Current* in 1959 asked readers, “Is your new home too dark?”<sup>478</sup> Reporting on recent findings from the Illuminating Engineering Society,

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<sup>476</sup> Ibid., 137.

<sup>477</sup> “Bulb Sales,” *The Hartford Courant*, December 16, 1961, 23; and “Record Bulb Sales,” *Chicago Tribune*, January 27, 1966, H8.

<sup>478</sup> Andy Lang, “Is Your New Home Too Dark?” *The Hartford Courant*, August 2, 1959, 11D.

the article indicated that there was great concern that “most homes in the United States are seriously underlighted.” Even though most households had achieved the recommended lighting levels for residential interiors established by the IES in 1952, the article reported that the recommendations had recently been found insufficient by researchers. Studies investigating “how much light the eye needs to perform working-and-living tasks efficiently and with a minimum of stress,” it was suggested, had revealed that “most seeing tasks actually required up to 150 percent more light than the 1952 recommendations.”<sup>479</sup> Although 40 footcandles was considered sufficient for studying at a desk in 1952, by 1959 the IES was recommending 70 footcandles. As with many such articles, this one ends with a warning: “Too little light, glare, and heavy shadows can be a strain on the nerves as well as the eyes.”<sup>480</sup>

Between 1945 and 1975, consumption of electric power doubled every ten years, by 1975 reaching levels eight times those at the end of World War II, with five-fold increases in illumination levels recorded between 1948 and 1963.<sup>481</sup> It is difficult to imagine that such remarkable increases would have been achievable without G.E.’s substantial resources and efforts to unify the industry through programs such as Better Light – Better Sight, Light Conditioning, Light for Living and Medallion Homes. Furthermore, it is important also to recognize the participation of women in these efforts, many of whom like Myrtle Fahsbender and her colleagues, sustained successful professional careers as consultants and home lighting specialists within the industry. Carrying on the tradition of civic consumers, these women acted as representatives of the issues and challenges facing homemakers to electrical engineers, industrial designers, and industry marketers, ensuring that the products and applications developed for the residential market responded to the real needs of American

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<sup>479</sup> Ibid.

<sup>480</sup> Ibid.

<sup>481</sup> Lawrence Schmidt, Scott Marratto, *The End of Ethics in a Technological Society* (McGill-Queen’s Press, 2008), 43; David Loehwing, “New Age of Light? Dazzling Innovations Hold Bright Promise for the Illumination Industry,” *Barron’s National Business and Financial Weekly*, December 6, 1963, 3.

women. Seeking out ways in which to integrate electric lighting into in the daily management of the household, the industry called upon the collective expertise provided by such women in conjunction with the substantial research capacity of the R&D laboratories of each of the major manufacturers and professional organizations such as the IES, in the development a host of new residential applications: cornice lighting, fluorescent lamps disguised behind valences, task lighting tailored to the requirements of each activity or chore, fixtures that could be installed in shelves and above cupboards, colored bulbs for easy and affordable redecoration efforts—anywhere and everywhere bright electric illumination infiltrated American postwar homes.

The staggering ambition of the electric industry to colonize and rapidly expand the consumer marketplace for electric light, as demonstrated in this chapter, calls attention to a number of important factors that helped shape the cultures of electric lighting in the United States during the twentieth century. Drawing heavily upon the gendered discourses and practices that informed popular attitudes and beliefs about women's roles in society, the home and family, and constituent factors in the agency and identity of women, the industry facilitated the pervasive reach of electric lighting deep into the social fabric of American life. The following and final chapter in this study shifts the focus from the context of gender and the rise of consumer culture in the United States during the twentieth century, to the development of the science and art of lighting design. Tracing the tensions and debates that quickly developed after the turn of the twentieth century regarding the role and place of electric lighting in architecture and the design of the built environment, Chapter 4 calls attention to questions of authorship and ownership, the influence of modernism, the electric industry's support of the development of illuminating engineering, and the contribution of lighting designers to the imaging of modern architecture in the United States. Returning to a number of ideas, individuals, and themes appearing in the first three chapters of this study,

Chapter 4 will offer a final perspective on how the design of electric lighting contributed to and was itself shaped by twentieth-century American culture.

## CHAPTER 4: THE SCIENCE AND ART OF LIGHTING

### Introduction: a Chasm of Misunderstanding

In 1963 journalist Maude Dorr reported for *Industrial Design* on the increasing importance of a relatively new breed of specialist—the architectural lighting consultant. Interviewing four lighting consultants, each with a different background, method, and focus, Dorr argued that in the work of these designers and others like them, architectural lighting had become “an art in itself.”<sup>482</sup> The lighting consultants featured in Dorr’s article were among the most influential figures contributing to the development of the discipline of lighting design in the postwar period: Richard Kelly, Abe Feder, William Richardson, and the innovative manufacturer and engineer, Edison Price. Calling attention to the sluggishness of the architectural profession in embracing the planning of electric light as an integral part of in the design process, Dorr suggested that architects were “just beginning to realize the plastic value of artificial light.” With optimism that hinted at the growing confidence of the discipline, Dorr described how the men featured in the article were “all teaching the architect to see the possibilities of artificial light and all hope to see the day arrive when it is a matter of routine for the architect to call in the lighting consultant at the beginning of a project rather than at the end.” Emphatically, she added the closing rationale, “Form is inseparable from light.”<sup>483</sup>

What is most fascinating for the historian of lighting design about Dorr’s predictions regarding the recent appearance of lighting professionals, and with them the introduction of new ways of approaching the illumination of the built environment, is what would appear to be her obliviousness to more than a half of a century of entrenched discourse shared by the disciplines of architecture and illuminating engineering on this very subject. More curious even, such sustained amnesia was not limited to journalists, and indeed, also characterized

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<sup>482</sup> Maude Dorr, “Lighting Consultants,” *Industrial Design* vol. 10 (June, 1963): 40-46.

<sup>483</sup> Dorr, 40.

much of the rhetoric within both disciplines. Over the course of the first half of the twentieth century discussion and debate within and between both communities again and again returned to question the aesthetic aims, responsibilities, and agency of each profession in relation to the planning and design of artificial illumination in the built environment. Faced with rapid and sustained advances in lighting technologies and applications throughout the first half of the twentieth century, by the midcentury architects by and large conceded the need for assistance with the planning and architectural integration of electric light. Yet how, when, and where such matters were to be considered within the design process, and by whom, remained a subject of contention for some time. The thorny issue of who was given authority over the conceptualizing of illumination proved a difficult rift to resolve; lighting specialists claimed architects did not have enough knowledge of illumination to envision a lighting plan, while architects argued that illuminating engineers lacked architectural training and therefore, were similarly too limited in their expertise to suggest lighting solutions prior to the design of the building. In 1936 the well-respected writer on architectural technologies, Tyler S. Rogers, called attention to this persistent issue, lamenting the prolonged distrust between architects and lighting engineers, writing of the “deep chasm between architects and engineers—a chasm wrought by the forces of misunderstanding.”<sup>484</sup>

In addition to the tensions antagonizing relations between architects and illuminating engineers, further friction developed within the lighting community between those who prioritized scientific methods over approaches that gave equal or greater importance to aesthetic considerations in the design and planning of illumination. Polarized power struggles between electrical and illuminating engineering over disciplinary ownership of lighting in the early years of the century frequently pitted science against art. As the electric industry grew

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<sup>484</sup> Tyler Stewart Rogers, “Light-Minded Architecture,” *Transactions of the Illuminating Engineering Society*, vol.31, no. 6 (June 1936): 576-582, quote on 579. On Roger’s career, see “Tyler S. Rogers, 72, Expert On Building,” *New York Times*, October 13, 1967, 39.

increasingly powerful in the USA, further debate also erupted between those who believed the profession should be free of the industry's influence and those who were supported or employed by it. By the early midcentury a number of prominent figures were publicly articulating and defending an independent specialization of lighting design, as distinct from both electric and illuminating engineering. The necessity of defining such specialization, as separate and distinct from either branch of engineering, was defended on the grounds that it was a new *design* discipline, one that applied the methods of design to the science of lighting.

The complex historical development of lighting design during the twentieth century was driven by a number of powerful forces, including the technological and professional challenge to the well-established discipline of architecture presented by electric light, the economic interests of electric utilities, lighting manufacturers, and big industry interests, and the softening boundaries of engineering in an age of technologically-driven aesthetics, as well as the interests of a number of designers and design advocates in co-opting this new luminous territory in service of defining an aesthetic style representative of American modernism, as discussed in Chapter 2.

This chapter explores these competing, conflicting, and occasionally complementary discourses and the passionate debates they engendered, illustrating their impact on the development of an independent profession of lighting design. Looking to the foundation for these debates, this chapter begins by focusing on the first decade of the twentieth century when the increasing adoption of electric light raised questions about the role of artificial lighting in architecture. This along with the competition presented by other popular forms of artificial light, demanded better control and regulation of the industry, setting in place the conditions that would lead to the formation of a specialized professional organization for those seeking to promote and develop new standards for its use. Examining the concerns that emerged from this context, and that fueled the protracted struggle over the use and uses of

light in architecture, this chapter explores how and in what ways architects and illuminating engineers cooperated, as well as when and where they did not, questioning how such resistance and acceptance influenced the development of architectural lighting.<sup>485</sup>

Also exploring the development of lighting design as distinct from illuminating engineering, this chapter gives attention to the broad origins of the discipline, examining the ways this context influenced or informed debates over the relative role or prioritization of science verses art in the planning of light, with particular interest given to why the quantitative was so frequently set in opposition to the qualitative. Highlighting the growing influence of modern architectural and design discourse in the 1930s and 40s, this chapter will also examine the impact of these new principles and practices on both architectural practice and lighting design, with special attention given to the manifestation of new types of architectural lighting as a result of these ideas and conditions.

Furthermore, it also examines the close involvement of the electric industry in supporting both the development of illuminating engineering and new applications of architectural lighting, raising the issue of the industry's simultaneous suppression of certain lighting technologies, which threatened their profits and monopolistic control of the lighting market in the United States. Exploring the ways in which some within the profession pushed back against industry's influence, this chapter calls attention to demands for independence from such ethically compromised relations with industry in the driving of the development of an independent profession of lighting design.

Finally this chapter looks at a number of theories and frameworks advanced in the first two-thirds of the twentieth-century that offered valuable guidance regarding the design of

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<sup>485</sup> Neumann has addressed this subject from various perspectives in *Architecture of the Night*, mapping early twentieth-century debates regarding the role of electric lighting in architecture and the contested relationship between illumination engineering and the architectural profession in the visual planning of the built environment in the United States from the turn of the century to the 1940s. However Neumann's study focuses most closely on facade and external architectural illumination, whereas this chapter offers closer investigation of the application of these theories to the illumination of the interior as well as in its architectural integration more generally. See, Neumann, "Architecture of the Night in the USA," in Neumann and Champa, 45-55.



light—as both a science and an art—in modern architecture specifically and more generally in the human environment. Analyzing both shared concepts and new perspectives, a compelling historical narrative for the development of lighting design becomes apparent, one that merges the principles of modern architecture with theories originating in modern stagecraft and gestalt-inspired visual design, as well as notions of the physiological and psychological effects of light.

### **The Founding of the Illuminating Engineering Society**

The proliferation of new and improved gas and electric illumination technologies at the turn of the century in the United States gave rise to a highly competitive commercial environment for all those invested or engaged in the distribution, sale, planning and use of artificial illumination.<sup>486</sup> In response, a number of individuals involved in this sector elected to join together to achieve better recognition and representation of their interests and ambitions. One of the more outspoken figures involved in these early discussions was Louis B. Marks, a prominent independent lighting consultant and electrical engineer.<sup>487</sup> In the fall of 1905, Marks contacted Van Rensselaer Lansingh, a colleague at the Holophane Glass Company, and E. Leavenworth Elliot a prominent voice in the community who would soon become the publisher of *The Illuminating Engineer*, seeking support for a proposal to establish a professional group dedicated to the advancement of artificial lighting. Both men agreed with Marks on the value of the proposed organization, and together the three began writing letters to key figures within the extended artificial lighting community, proposing the formation of a “Society of illuminating engineers, composed of those people who are especially interested in the question of light and its distribution.”<sup>488</sup>

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<sup>486</sup> David L. DiLaura, *A History of Light and Lighting: in Celebration of the Centenary of the Illuminating Engineering Society of North America* (Illuminating Engineering Society of North America, 2006), 8-9.

<sup>487</sup> *Ibid.*, 7.

<sup>488</sup> Samuel G. Hibben, “The Society’s First Year,” *Illumination Engineering* vol. 51, n. 1 (June, 1956): 145-150.

Setting a date for an initial gathering at the Astor Hotel in New York City in late December, Marks and his colleagues received nearly unanimous support from those they contacted for the proposed group, including from such influential individuals as the director of the Electrical Laboratory at Purdue University, the Secretary of the United States Treasury Department, the president of the American Institute of Electrical Engineers (AIEE), the editors of the industry journals *Electrical Age* and *Electrical World*, and a number of others from similarly diverse backgrounds.

While all those initially involved were largely supportive of the proposal, those most closely associated with electrical engineering expressed the greatest reservations about the formation of a society that would characterize illuminating engineering as distinct from electrical engineering. Both John W. Lieb, president of the AIEE and W.D. Weaver, editor of *The Electrical World and Engineer*, noted concern in their responses to Marks's invitation. Lieb stressed the importance of avoiding the replication of existing communities so as not to appear as a challenge to older, established groups. In his response, he suggested that there was greater benefit in more broadly and diversely defining the membership of the proposed organization:

I would emphasize that very great care be taken so as not to conflict even in appearance with the existing technical bodies such as the American Institute of Electrical Engineers or the American Gas Light Association, but it would seem to me desirable to open the doors as widely as possible to commercial interests also as well as the professional class.<sup>489</sup>

Lieb's suggestion that it would be advantageous to seek participation from "commercial interests" rather than "existing technical bodies" reveals a balanced awareness of both the potential threat of Marks' proposal to more deeply divide disciplinary territories within engineering, as well as the potential value of such a society to the commercial development of the lighting industry. Lieb's close knowledge of both sides of the industry was informed

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<sup>489</sup> Letter from J.W. Lieb, Jr. to L. B. Marks, dated December 1905, reproduced in DiLaura, 12-13.

by his roles as General Manager of the New York Edison Company and president of the AIEE. Certainly he was aware that electricity providers would stand to gain from access to and representation within such a group, so his response might be seen as both a cautious warning and subtle encouragement to Marks.

Weaver however, was more direct in his criticism of the proposed society. Responding to Marks' invitation, Weaver began his reply with what he believed to be the positive aspects of the proposal, stating that he was very much in "sympathy with the movement toward establishing illuminating engineering as a specialty," particularly "in view of the present keen competition of gas," and that there was potential benefit to the industry as a whole in "placing the matter of the distribution of light units in the hands of specialists who will produce the best results."<sup>490</sup> While agreeing with the objectives of Marks' proposal, he indicated that he did not believe that "this end can be best served by the formation of a Society of Illuminating Engineers." He offered two principal reasons for his position:

First, I believe that before illuminating engineering can become fully appreciated and reach the status which it deserves, a great deal of missionary work is necessary, and particularly among the whole body of electrical engineers of this country. I think it must be confessed that at the present time consulting electrical engineers and others laying out lighting circuits consider that they themselves are sufficiently qualified to work out problems relating to illumination, and that until convinced to the contrary they will oppose the participation of an illuminating expert in the laying out of work on which they are engaged as engineers, or concerning which they are asked for advice...Second, the formation of a body of illuminating engineers, many of the members of which would be present members of the A.I.E.E., would be regarded by perhaps the majority of members of the latter body as an injury to the Institute; or if the feeling would not be this deep it would at least amount to a prejudice against the new body.<sup>491</sup>

Weaver suggested that his remarks were not based solely on his intuition regarding the "feelings of electrical engineers," but rather were informed by his knowledge of the development of professional bodies in the United States and Great Britain.

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<sup>490</sup> Letter from W.D. Weaver. to L. B. Marks, dated 16 December 1905, reproduced in DiLaura, 13-14.

<sup>491</sup> Ibid., 13-14.

Echoing Lieb, he argued that historically, the formation of “a body representing even a minor object of an existing national body is always resented, and alienates the sympathy of members of the older body from the members and purposes of the newer one.”<sup>492</sup> Despite his measured opposition, Weaver did not reject Marks’ proposal outright, instead he suggested that extensive professional outreach and education was necessary first. He held that rather than establishing a society for illuminating engineering, individuals practicing in this area should “exert all their efforts towards spreading knowledge of the art of illuminating engineering and the functions of the illuminating engineer, through the *Transactions of the American Institute of Electrical Engineers*.” Essentially Weaver was proposing that illuminating engineering should be defined, in time, and as a subset of electrical engineering. Such a position privileged the growing majority of those practicing illuminating engineering as a subset of electrical engineering, a bias further underscored by his omission of any consideration of illumination engineering outside of that of electrical, which was indeed a vital aspect of the original proposal that hoped to unite these diverse groups.

Putting aside such resistance and criticism, Marks and his colleagues gathered twenty-five supporters for an initial meeting in late December of 1905 in New York City. Elected temporary chairman, Marks called the meeting to order with strategic diplomacy, stating the evening’s objective to be defining the role and aims of the proposed illuminating engineering society in relation to “its sister institution, the American Institute of Electrical Engineers.”<sup>493</sup> All in attendance for this first gathering agreed that the society would be of broad benefit and approved the proposal. The remaining task was the selection of a name for the new association, which was decided only after some debate. The discussion largely revolved around whether or not “engineer” should be included in the title, a main point of contention within the diverse group. Among the names proposed were “Illuminating Society” and “The

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<sup>492</sup> Ibid., 14

<sup>493</sup> Hibben, 147.

Society for Economical Illumination.”<sup>494</sup> Tellingly, General Electric’s Walter D’Arcy Ryan, remarked that he thought the use of term “engineering” in the name of the association was “frightening” and that a better and more unifying name would be the “Light Improvement Association.”<sup>495</sup> The principal argument against the inclusion of engineer or engineering in the association’s name was that it would identify the new group too closely with existing organizations, and furthermore that it was not suggestive enough of the primary aim of the group to support and encourage better and more efficient lighting practices. Despite the discomfort of some members about including reference to engineering in the name of the society, the group eventually voted in favor of the designation “Illuminating Engineering Society” on January 10, 1906.<sup>496</sup> Within a month the group had over 150 members, and by January 1907, membership had grown to over 800 with regional sections in New England, Chicago, Pittsburgh, Philadelphia, and New York.<sup>497</sup>

Even with such rapid growth, the Illuminating Engineering Society (I.E.S.) still had much ground to cover before it could be seen as posing a significant challenge to the AIEE, which had over 3,700 members in 1905. Furthermore, concerns that the very formation of the I.E.S. would destabilize the profession of electrical engineering were addressed in the society’s constitution, approved in 1906. Article II stated the objective of the society to be “the advancement and dissemination of theoretical and practical knowledge of the Science and Art of Illumination,” and set out broad eligibility for membership, stating: “Any person interested in the objects of the society shall be eligible to [sic] membership.”<sup>498</sup> With explicit emphasis on the “advancement and dissemination” of knowledge, rather than the application of knowledge, and membership open to any persons “interested” in the society’s aim, the I.E.S. carefully distinguished itself from both the profession of electrical engineering and its

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<sup>494</sup> Ibid.

<sup>495</sup> Ibid.

<sup>496</sup> Hibben, 149-150; DiLaura, 19.

<sup>497</sup> Hibben, 149-150; DiLaura, 19.

<sup>498</sup> DiLaura, 19.

most prominent professional society, the AIEE. An individual seeking to join and participate in the I.E.S. did not need to be technically trained or certified, and importantly, as Lieb had recommended earlier, the society also welcomed members associated with the commercial branch of the industry. Weaver, who had been most articulate in his concerns about the group during initial discussions, drafted the constitution, so the emphasis on broad membership and the advancement of specialist knowledge is not surprising. While he may have intended this as a defensive tactic, in establishing the aims, objectives, and membership criteria within the society's constitution as clearly distinct from the AIEE, Weaver and the other early members who approved the society's constitution, established the defining characteristic for the emerging discipline of illuminating engineering. Having agreed upon a name and a constitution, and with substantial and growing membership, in the coming years the I.E.S. would focus its efforts on two key factors the society held as most pressing for the advancement of illuminating engineering: increasing the efficiency of artificial lighting and improving the visual quality of the lit environment. Negotiating the balance between quantitative and qualitative factors, the society and its individual members actively engaged with "the science and art of illumination," with some members seeing this as less of a continuum and more as two distinct approaches, some privileging science and others art as the foundation for planning light.

### **Marks' Inaugural Address: Wasted Light, Wasted Sight**

The first official meeting of the newly formed Illuminating Engineering Society took place on February 13, 1906, once again held at the Hotel Astor in New York City. The society's inaugural event received much attention in the press, as did the address given by Marks, the

society's newly elected president.<sup>499</sup> As reported the following day in the *New York Tribune*, Marks' surprisingly convincing address included the expected discussion of: "recent advances in the art of lighting, supply statistics showing the extent of the industry, and...some statement of [the society's] scope and plans."<sup>500</sup> Less expected and widely applauded was his impassioned call for the society to address human needs and to seek not just more efficient lighting, but better lighting. In so doing, he subtly set out an important distinction for the I.E.S., suggesting that the typical approach of electrical engineers to questions of artificial lighting had failed to prioritize this important factor. Further underscoring the divergence of the methods and aims of the I.E.S. from established practices and definitions of engineering, despite inclusion of the term in the society's name, Marks' stated:

The term 'engineering', as used in the name of this Society, unless viewed in its broad sense, is to a certain extent a misnomer, as the Society will deal with some phases of illumination that may not properly be said to come within the distinct field of engineering, such for instance as the physiological side of the question.<sup>501</sup>

Drawing attention also to the other distinguishing feature of the I.E.S., Marks announced to all those in attendance, which included individuals from many areas of the lighting industry and beyond, including manufacturers, suppliers, consultants, academics, and scientists, that the society would "throw its doors quite as wide open to the layman as to the professional."<sup>502</sup>

While Marks' overview of the aims and conditions of membership was undoubtedly of interest to many of those in attendance, the media demonstrated little attention to such distinctions, gravitating to the more sensational elements of his inaugural address. Indeed, while the *New York Times* garbled the membership message, reporting that, "the society is an

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<sup>499</sup> "Cost of Lighting: Expenditure for Electricity and Gas Compared," *New York Tribune*, 14 Feb. 1906, 5; "Sees \$20,000,000 Waste in Country's Light Bill," *New York Times*, February 14, 1906, 6; "Progress of Illumination: Cost in the United States Estimated at \$200,000,000 a Year—Great Waste," *Wall Street Journal*, February 14, 1906, 5; and "The Art of Lighting," *New York Tribune*, February 15, 1906, 6.

<sup>500</sup> "The Art of Lighting," 6.

<sup>501</sup> DiLaura, 18.

<sup>502</sup> *Ibid.*

organization of engineers in gas and electricity,” the paper accurately and emphatically reported Marks’ discussion of the alarming financial implications of wasted artificial light. The figures he presented detailing national consumer spending on artificial lighting sources were reproduced in the city’s major newspapers the next day, even carrying the headline, “Sees \$20,000,000 Waste in Country’s Light Bill” in the *New York Times*.<sup>503</sup> That this data would appear so prominently in all reports of the I.E.S.’ inaugural event indicates the general surprise and concern elicited by Marks’ comments regarding the economic significance of the nation’s annual consumption of artificial lighting.

Gathering information from the 1905 United States Census Report, Marks cited the total cost to United States consumers for artificial illumination—gas and electric combined—at approximately \$200 million each year. More important than the total amount spent on lighting nationally was the money lost from inefficient or ineffective lighting Marks argued. With a statement that would earn him the *New York Times* headline, he claimed, “Of the vast amount expended for lighting, fully \$20,000,000 is wasted, as far as the amount of useful illumination delivered for the money is concerned.”<sup>504</sup> Suggesting that examples of such wastefulness could be found nearly anywhere one might look, he argued that it was “not at all uncommon to find that in electric lighting 25 percent of the light furnished is lost, as far as useful purpose is concerned, by improper disposition of the light sources of inequitable equipment of lamps, globes, shades, or reflectors.”<sup>505</sup> Similarly, while noting that technology and applications of gas lighting were different from electric lighting, he posited that the issue of wasteful lighting practices was very much the same for both.<sup>506</sup>

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<sup>503</sup> “Sees \$20,000,000 Waste,” 6.

<sup>504</sup> Ibid.

<sup>505</sup> Ibid.

<sup>506</sup> A respondent to Marks’ talk, Dr. Arthur H. Elliot further emphasized this point, claiming the average householder “gets about two-thirds of the light value he is paying for...[it] is a great waste and it ought to be stopped.” Quoted in “Sees \$20,000,000 Waste.”



Having established the national urgency informing the society's founding, Marks proposed that the I.E.S. focus its efforts first on addressing this situation, gathering "authoritative data on the subject of illumination" and ensuring that this information would be "accessible to all."<sup>507</sup> Describing the second objective of the society, which was in fact very much tied to the first, Marks called attention to the human cost of poor lighting practices, and as suggested above, this was an aim that clearly separated the mission of I.E.S. from that of electrical engineering. Thus in addition to wasting light and money, the improper distribution of artificial light also presented a significant human cost. As he argued:

The practice of placing lights of excessive intrinsic brightness within the ordinary field of vision is so common as to cause apprehension among those who have studied the question from a physiological standpoint that our eyesight is suffering permanent injury.<sup>508</sup>

As evidence of this claim, he recounted that, "the percentage of children with defective eyesight is growing year by year" and that "according to oculists, the strain on eyesight by bright lighting is in a large measure responsible for this."<sup>509</sup> This was tenuous claim perhaps for the new president of a society whose first mission was to gather "authoritative data", but effective nonetheless in capturing the press and the public's attention.

Such negative effects on human vision and visual comfort could be avoided Marks proposed, by concealing or diffusing light sources and avoiding exposed, unshielded sources of illumination. Thus, both of the challenges set forth in Marks' inaugural speech—the wasteful use of artificial light and the negative physiological impacts of this wastefulness—could be addressed with the same solution, that is, the collection and distribution of better information regarding the performance and control of illumination, and the use of data in developing and promoting the use of more sophisticated equipment for the shading,

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<sup>507</sup> Ibid.

<sup>508</sup> Ibid.

<sup>509</sup> Ibid.

reflection, and focusing of light. However compelling this rallying cry might have been, Marks' focus on the wastefulness of contemporary artificial lighting practices was largely limited to fixture design, or the lack thereof. The focus on the distribution of light from the source of the illumination, rather than in relation to the environmental context and conditions of the lighting challenge, suggests something of a naïve understanding of the potential scope and role of the illuminating engineer at this time, or at least as described by Marks. However, in the decade to follow, such considerations would very much come to the fore in the work and discourse of the society.

Regardless of such issues, Marks' address resonated well with the media, as suggested above. Reports that followed the event emphasized the society's awareness of consumer needs and concerns, reiterating that such concerns were something quite outside typical engineering practices.<sup>510</sup> While this focus remained consistent in the first few years following the founding of the I.E.S., such aims were quickly clouded by dissent over what constituted good lighting practice, what factors were necessary to determine lighting efficiency, prioritization of aesthetics, and the appropriate lighting of architecture. Each of these issues elicited more disagreement than consensus, a situation that resulted in part from the disciplinary and methodological diversity of the society's members as well as the youth of the specialization. These factors, in conjunction with pressure from commercial and professional interests, fueled extended debate within the discipline throughout the first half of the century.

### **Establishing the Field: *Transactions* and *The Illuminating Engineer***

The texture and tenor of these discussions is captured in the many papers and responses published in the organization's journal, *Transactions of the Illuminating Engineering Society*,

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<sup>510</sup> "The Art of Lighting," *New York Tribune*, February 15, 1906, 6.

the first issue of which appeared at the same time as the group's founding, February 1906. Nearly simultaneously *The Illuminating Engineer* also appeared, as an independent counterpoint to the society's official record, offering journalistic coverage of relevant news and events as well as scientific reports from the illuminating engineering community. Published and edited by E. Leavenworth Elliot, one of the founding members of the I.E.S., *The Illuminating Engineer* was not intended to compete with *Transactions* so much as to be an industry complement to the society's journal.<sup>511</sup> Examined together these two publications suggest the great ambition of the first generation of illuminating engineers as well as the immense breadth of the challenges posed by the integration of ever more powerful, specialized, and numerous sources of artificial light into the built environment.

The wide-ranging topics covered within both journals during the first ten years of publication reveal the challenges of an industry and a discipline struggling to respond to the proliferation of new technologies and typologies of artificial lighting developed during this period. Typical subjects included: characteristics of filament lamps, photometrics, analysis of and recommendations for the illumination of particular room typologies, street lighting, color and its effect on illumination, colored light and its effect on perception, the physiology of vision and the effects of illumination on the eye, fixture designs for gas and incandescent lamps, reflectors, gas mantles, the development of other illumination equipment and controls, and many other detailed analytical studies.<sup>512</sup> The majority of the research papers and technical reports published in *Transactions* and *The Illuminating Engineer* dealt with traditional engineering inquiries, following established scientific methods and producing findings that quantified effects and qualified theories with mathematical formulae. As a nascent field of inquiry and applied science, illuminating engineering was very much in need

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<sup>511</sup> E. Leavenworth Elliot, "Our First Birthday," *The Illuminating Engineer* vol. 2, no. 1 (March, 1907): 39-45.

<sup>512</sup> Both *The Illuminating Engineer* and *Transactions of the Illuminating Engineering Society* included subject and author indices in the front matter of each issue (or volume, as was the case of some years of the *Transactions*).

of such a body of research—indeed, the production and dissemination of new knowledge about illumination was a central aim of the I.E.S. from its inception. Yet, the bulk of these studies and reports all but omitted the other half of the society’s original objective, that of the art of illumination and the qualitative impact, both positive and negative, of artificial light in the human environment.

### **An Architect’s Point of View: Light as Related to Architecture**

Although a minority within the illuminating engineering community in the first two decades of the twentieth century, there were a number of individuals who devoted much thought and effort towards defining what the art of illumination might entail. For a discipline purposely defined in the broadest terms yet most concretely tied to engineering, the slippery question of the place of art, aesthetics, and emotive objectives in the planning and distribution of light was highly contested. Furthermore, when the issue of aesthetics was broached, typically it was in regards to electric lighting, not gas or oil illumination sources. This was due in part to the technical limitations of such flame-based illuminates, as discussed in Chapter 2, but more importantly to the sustained support of the American electric industry in exploring such applications of electric light. The relentless pursuit of ever-greater and more spectacular electric lighting effects at American world’s fairs and exhibitions by the industry’s leaders General Electric and Westinghouse, as addressed in Chapter 1, offers dramatic evidence of their commitment to the development of artistic applications of electric lighting. Witnessed by vast public audiences, the industry recognized the valuable financial and political returns of their investment in such aesthetic and spectacular applications of electric illumination.<sup>513</sup>

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<sup>513</sup> See Neumann, “Architectural Illumination Before the Twentieth Century,” and “‘Architecture of the Night’ in the U.S.A.,” both in Neumann and Champa, 8-15 and 54-63.

However, this was just one of the industry's methods to gain popular support, and therefore market share for electric power and light.<sup>514</sup> Even before the turn of the century, critics were suggesting the demise of gas and oil illumination in the face of the rapid development of electric light, which was purported to be cleaner, quieter, and more reliable than flame-based light sources. In 1899 the *Chicago Daily Tribune* reported on the enormous leap in the public's expectations of artificial light, claiming:

Twenty years ago the flickering gas flame or the sputtering, smoking oil wick would scarcely be noticed, but today the slightest variation in the incandescent lamp is considered sufficient grounds for complaint. The public has been educated up to higher requirements, and the electric lighting companies endeavor to raise this standard constantly; thereby insuring immunity from gas competition.<sup>515</sup>

While the eventual success of electric light in unseating gas as the preferred illumination source in the United States was far from a given in 1899, such propagandistic reporting became increasingly common after the turn of the century. Aided by the slow and steady consolidation of competing interests and greater standardization within the electric industry, a greater focus on and appetite for such aesthetic and qualitative concerns developed within the emerging illuminating engineering community.

Whether owing to the much older and established discourse addressing the role of beauty and aesthetic effect in architecture, or to more pragmatic factors related to the capacity of architecture to serve as a background or context for luminous effects, most frequently the expressive potential of electric light was framed in relation to architecture and architectural ornament. A prominent voice among those addressing the aesthetic implications of contemporary lighting practices on architecture in the first decade of the twentieth century was C. Howard Walker, a professor of architecture at Massachusetts Institute of

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<sup>514</sup> On the tumultuous early years of the electric industry and the significant role of public relations, as well as technological innovation, in its development, see Richard Munson, *From Edison to Enron: the Business of Power and what it Means for the future of Electricity* (Westport, CT; Prager Publishers, 2005).

<sup>515</sup> "Electric Lighting," *Chicago Daily Tribune*, July 23, 1899, 30.

Technology.<sup>516</sup> In a talk presented to the Illuminating Engineering Society in 1907, “Electric Light as Related to Architecture,” Walker shared “the architect’s point of view,” imploring the group to recognize that “when architecture is illuminated decoratively, it is not so much for the purpose of displaying the lamps as it is for the illumination of the architecture itself.”<sup>517</sup> Arguing that the application of electric light to architecture should be “approached discriminately,” Walker proposed that in any situation consideration should be given firstly to “the character of the lighting” and secondly, “to its position upon the buildings.”<sup>518</sup>

Differentiating between the relative character of reflected, diffuse, and direct light, he argued that the best luminous conditions were achieved with reflected lighting. However, Walker suggested that more sophisticated architectural effects could be produced when direct lighting was used in conjunction with reflected lighting, as this approach allowed a “new and entirely separate intent...i.e., that of making a design in light itself associated with the architecture...indicating its structure, but not its masses.”<sup>519</sup> In reference to this point, Walker decried a number of contemporary lighting practices, while saving his strongest criticism for outlining—the technique Luther Stieringer made popular through its use in number of America’s most successful world’s fairs during the late nineteenth-century. In particular Walker was critical of the use of unshielded lamps in outlining, particularly those accentuating vertical structural elements, which he argued diminished a viewer’s spatial perception.<sup>520</sup> Alternatively he proposed that more satisfactory results were obtained when light sources were located at “some little distance from the surfaces lighted,” and used in

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<sup>516</sup> Walker’s position as an early figure in this discourse is also noted by Neumann in “‘Architecture of the Night’ in the U.S.A.,” in *Architecture of the Night*, 54.

<sup>517</sup> “Electric Light as Related to Architecture,” *Journal of the Society of Architects*, vol.1, no.6 (April, 1908): 236-238; and Charles Howard Walker, “Electric Light as Related to Architecture,” *Transactions of the Illuminating Engineering Society* vol. 2 (Oct., 1907): 597-602.

<sup>518</sup> “Electric Light as Related to Architecture,” *JSA*, 236.

<sup>519</sup> *Ibid.*, 237.

<sup>520</sup> Neumann discusses this point as well in *Architecture of the Night*, 54.

combination with horizontal outlining.<sup>521</sup> Finally, raising an issue that would serve as a source of debate for some time, Walker turned his criticism to the architectural profession, suggesting that in order to produce truly successful buildings, architects needed to consider the appearance of the structure both by day, under daylight, and by night, with electric illumination. Furthermore, he urged architects to acknowledge that these were not one and the same, that day and nighttime appearances were intrinsically different, but that both could be equally pleasing if this distinction was taken into account. Offering an example, he described how, “The motif of reflected light from above, which has in it luminous deep shadows, is excellent lighting by night. It gives a new pleasure, and is perfectly consistent with any good architecture, but it is different from daylight.”<sup>522</sup> Despite the magnitude of integrating such new considerations to existing architectural practice, Walker suggested there was an existing problem that had to be addressed first before the art of architectural illumination could be fully developed—the poor standard of much of the architecture in the United States. He argued that the emerging discipline of illuminating engineering could be stalled in its development because of a lack of buildings of sufficient merit to warrant illumination.

On this point and others, Walker offered a balanced perspective on the issues posed to architectural practice by electric lighting. However fair and measured his observations and analysis, he consistently maintained the architect’s point of view he promised at outset of his talk—a point of view firmly located within architectural discourse, principles, and practices. Furthermore, Walker’s comments only address exterior, architectural illumination, omitting the whole realm of interior architectural lighting from his discussion. While few architects at this time joined Walker in his consideration of architectural illumination, his talk found an

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<sup>521</sup> “Electric Light as Related to Architecture,” 237.

<sup>522</sup> *Ibid.*, 238.

attentive and receptive audience among the illuminating engineering community.<sup>523</sup> The significance of Walker's talk was widely noted and it was subsequently published in the *Transactions of the Illuminating Engineering Society* and in the *Journal of the Society of Architects*.

### **Basset Jones: An Illuminating Engineer's Point of View**

Perhaps inspired by Walker's talk, or maybe as a response, the I.E.S. also sought to weigh in on the place and importance of aesthetics in architectural lighting, but this time from the point of view of the illuminating engineer. The officers of the New York section of the I.E.S. invited Bassett Jones, Jr., a founding member of the society and widely respected lighting engineer, to submit a position paper on this "subject of such vital importance for the profession."<sup>524</sup> His response, "The Relation of Architectural Principles to Illuminating Engineering Practice," was published in January 1908 just three months after Walker's essay. One of the most considered appeals for greater sensitivity to aesthetic aspects within illuminating engineering to that date, Jones' paper elicited impassioned and diverse responses, and set an important point of reference for further discussion of this subject within the community.<sup>525</sup>

Beginning with what some would consider an indictment of the disciplinary shortcomings of illuminating engineering, Jones opened his essay with the statement: "Successful illumination of structures making an appeal to the sense of beauty requires a

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<sup>523</sup> Among those in attendance was Walter D'Arcy Ryan, who one would suspect found great sympathy with Jones' assertions. Neumann has suggested Jones' talk perhaps influenced Ryan's use of light projectors on Niagara Falls in 1907 in *Architecture of the Night*, 54.

<sup>524</sup> Addressing the published responses to his paper, Jones indicated that, he did not understand "why the officers of the section should have selected me to write on a subject of such vital importance to the profession." But once he had agreed to do so, he argued that he had done his "very best to present it in a light best calculated to draw forth discussion." Bassett Jones, Jr., "The relation of Architectural Principles to Illuminating Engineering Practice," *Transactions of the Illuminating Engineering Society* vol. 3, no. 1 (Jan., 1908): 9-65; quote on pp. 59.

<sup>525</sup> *Ibid.*, 59.



more or less developed sympathy with the aesthetic qualities of the design.”<sup>526</sup> However, Jones continued by stating in order to acquire the capacity for “sympathy” in the appreciation of aesthetic concerns, one needed first to understand clearly what was meant by the “aesthetic qualities of a design.” Although this might seem self-evident, he argued otherwise, suggesting that “the engineer has, unfortunately, little opportunity of learning to appreciate beautiful things, and his limitation in this regards often leads him unduly to accent what he terms ‘practical considerations.’”<sup>527</sup> Expanding the definition of “practical”, Jones proposed that aesthetic concerns might also have intrinsic practical value, suggesting that “[the engineer] sometimes forgets that there is an essentially pragmatic purpose at the basis of all true art, and that the aesthetic emotions are increasingly important as man reaches the higher stages of mental development.”<sup>528</sup> Such evolutionary attitudes were prevalent in the United States in the later nineteenth century and the early years of the twentieth century, particularly within the discourse of the nation’s cultural progress wherein such teleological beliefs claimed the intellectual appreciation of art and beauty as evidence of an advanced civilization, as discussed in Chapter 1. Such attitudes surely would have had some recognition within the illuminating engineering community, as a number of its more prominent members had contributed to the sophisticated lighting programs that were meant to embody evolutionary narratives at American world’s fairs in this period, as discussed in Chapter 1.<sup>529</sup>

Jones’ emphasis on the importance of developing both a knowledge of and sensitivity to aesthetic qualities was probably informed by such attitudes. Adding further historical and cultural gravitas to his argument, Jones called upon the precedent set by Antiquity, which he described as, “having attained a plane of intelligence in some respects higher than that

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<sup>526</sup> Jones, “The Relation of Architectural Principles to Illuminating Engineering Practice,” 9.

<sup>527</sup> *Ibid.*, 9.

<sup>528</sup> *Ibid.*, 9.

<sup>529</sup> See Chapter 1, “Narratives of Progress,” 45-52.

reached by the most advanced modern peoples.” Ingeniously crafting an analogy that equated aesthetic advancement with scientific invention, Jones posited: “to the early Greeks, improvement in artistic method was of as great practical importance as any advance in scientific discovery is to ourselves.”<sup>530</sup> Jones’ lengthy preamble with references to ancient Greek culture and repeated insistence on the importance of an aesthetic sensibility to any civilized society suggests a subtle insecurity about the potential reception of his argument, or at the very least, a suspicion that this would be a difficult message to convey convincingly to the illuminating engineering community. The published responses to his paper reveal that this was indeed the case.

Highly unusual within the context of the technical papers typically published in *Transactions*, before Jones even broached the primary subject of his essay, he meandered through four pages of scholarly exegesis on the “nature of the aesthetic.”<sup>531</sup> Quoting from Shakespeare and referencing Wagner’s *Tristan and Isolde*, Jones defined the aesthetic sensibility as a “hyperlogical judgment—a judgment of feeling rather than of knowledge.”<sup>532</sup> With emphasis on a synthesis of such facilities as sympathy, recognition, imagination, congruity, and harmony, he described this sensibility in relation to the perception of beauty, writing:

For the perception of the beautiful depends on three things: a) pleasure attaches to form and not material of sensation, b) the object must be recognized as implying relations not immediately present, c) there must be some concordant series or composite of agreeable objects.<sup>533</sup>

Offering two concrete examples, Jones described the conditions necessary for the perception of beauty in relation to music and color—two aesthetic media often likened to light:

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<sup>530</sup> Ibid., 9.

<sup>531</sup> Ibid., 10-14.

<sup>532</sup> Ibid., 10.

<sup>533</sup> Ibid., 13.

A single tone may be sensuously agreeable; an aria or harmony (series or composite) is necessary to arouse aesthetic feeling. A single color of moderate intensity may give purely organic pleasure, but it takes an orderly arrangement of shades and colors to tickle the imagination.<sup>534</sup>

Building upon his definition of “the feeling of the beautiful,” Jones set about describing the role of the aesthetic within the principles of architecture. Returning to the example of music, he likened the aesthetic quality of harmony to the architectural principle of proportion, and he ascribed ornament with the capacity to communicate “relations” or function, stressing the importance of maintaining a harmonious balance, both visually and aesthetically, between the individual elements of the architectural composition. Such aesthetic congruency, he argued, determined the pleasurable perception of the whole. Indeed, the notion of aesthetic pleasure is a continuous theme throughout his essay. When finally addressing the necessary conditions of exchange between the illuminating engineer and the architect, Jones posited that successful partnerships between the two disciplines had the greatest potential to result in pleasurable visual experiences. Summarizing, he wrote:

I have noted, on the part of many contributors to the literature of illumination, a disposition to decry and criticise the limitations which architects place upon their work. They do not seem to realize that the beauty and effectiveness of good architectural construction, both from aesthetic and utilitarian standpoints, depend [sic] upon a strict adherence to the principles outlined above, and that the feeling of the design dependent, as it must be, upon historical precedent is bound by centuries of usage to certain effects of color and light which have become established because of their appeal to the sentiments aroused by pleasurable visual perception. The business of the illuminating engineer is to modernize old methods of illumination without destroying them.<sup>535</sup>

Here the question of how to illuminate historic architecture in a way most sympathetic to the established principles and traditions of architectural practice comes to the fore of Jones’

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<sup>534</sup> Ibid., 13. At the conclusion of this passage, Jones provides a rare footnote, citing George Trumbull Ladd’s *Psychology* (1894). In his paper Jones also noted the usefulness of several other sources including the evolutionary psychologist, J. Mark Baldwin’s *Mental Development in the Child and the Race* (1896), the experimental psychologist, and Bernard Bosanquet’s *History of the Aesthetic* (1892). The last text offers an indication of the basis of Jones’ eclectic framework, surveying the philosophical discourse on beauty, including Burke, Hogarth, Reynolds, Kant, Schiller, Goethe, and Hegel.

<sup>535</sup> Ibid., 23.

essay, as he applies the concept of a culturally learned aesthetic sympathy to traditional architectural styles. In particular Jones focused on the appropriate design and integration of electric lighting fixtures into historic interiors, as well as the tone, intensity, and quality of light suitable for such spaces. Offering numerous examples of well-known interiors with harmonious and historically appropriate lighting, such as Fountainbleau's *Salon de Gardes* and the Petit Trianon's *la Grande Salle à Manger*, he argued that "the illuminating engineer, who imagines that he will be permitted to introduce anything radically new into the illumination of buildings possessing historic feeling is doomed to disappointment."<sup>536</sup> Instead, Jones advised that the illuminating engineer must follow the lead of the architect, who determines the "conception of the whole arrangement" from the "feeling of the design" to the "last detail of the fixtures."<sup>537</sup> That Jones would develop his argument in relation to historic architecture is not unexpected, given that the larger, more prestigious commissions for which a lighting engineer would most likely be employed were typically executed in historical styles in this period. Furthermore, Jones' eclectic definition of aesthetic experience was well suited to the discussion of popular historical styles. For "sentiment" or the "feeling of the design" to be properly aroused, the perception of "actual sensory matter" had to be intellectually coordinated with a host of "associative material" and synthesized within a final, complete "idea."<sup>538</sup> According to Jones, this "associative material" was derived from knowledge of appropriate environmental conditions for specific types and styles of architecture. The notion of even considering architecture devoid of historical ornament for anything other than the most basic commercial or factory buildings seemed absurd to Jones:

The use of steel, and similar materials requiring slender proportion, is of very recent occurrence. So far it is true that any degree of study of the aesthetic features of buildings will produce a great superabundance of feeling for the heavier construction of wood and stone. And the memory coefficient will

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<sup>536</sup> Ibid., 23-25.

<sup>537</sup> Ibid., 23.

<sup>538</sup> Ibid., 25.

naturally produce a sentiment in favor of heavy proportions even where steel is used. The time is by no means ripe for a deliberate use of steel as steel, unless some means is adopted to increase its apparent weight.”<sup>539</sup>

Unfortunately, Jones’ reliance on a framework predicated upon the translation of pre-electric lighting conditions to historic and contemporary beaux-arts architecture would become increasingly limited in its usefulness as modern architecture gained popularity in the United States during the later 1920s and 1930s. However, the more generalized aspects of Jones’ framework, especially his call for illuminating engineers to prioritize aesthetic considerations above quantitative-driven design, would be of much longer lasting value to the discipline and indeed, elicited the greatest response following the publication of his paper. Jones summarized the core of this argument:

The illuminating engineer must use the laws of distribution, not as a method of determining what the distribution shall be, but as a means of adapting the lamps to the distribution required. It is not a question of foot-candles: it is a question of how much light is needed. And it is more often a question of quality than quantity.<sup>540</sup>

With this and other similar points, Jones sought to displace the predominance of scientific measurement in illumination engineering as the primary design determinant, arguing instead for the privileging of aesthetic considerations as the first and final factor in the planning of light.

While these suggestions caused general anxiety among the illuminating engineering community, it was Jones’ insistence that artistically well-conceived lighting should also be physiologically suited to please the human eye that proved to be the most incendiary of his claims. The impact of artificial illumination on the performance and health of the human eye was an issue of great concern for the I.E.S., as indicated by Marks’ prioritization of this issue in his inaugural address. Indeed, improving lighting sources and methods to reduce the

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<sup>539</sup> Ibid., 18.

<sup>540</sup> Ibid., 24.

negative effect of artificial illumination on the vision of the nation's population was a primary objective of the society in this period. Therefore any challenge to the scientific grounding of the I.E.S.'s position on this issue was taken very seriously. Controversially, Jones put qualitative judgment before scientific measurement, suggesting that physiological comfort and aesthetic pleasure in visual perception were inextricably linked:

No architectural design, conceived in the right spirit, and properly executed, can demand any suitable artificial illumination that is injurious in the optical sense... Artistic illumination is, *ipso facto*, good illumination. And no illumination can be artistic that is not conceived as a feature of a truly artistic design.<sup>541</sup>

Perhaps sensing the potentially divisive nature of his position, Jones conceded the need for different approaches to illuminating engineering and suggested that the method he advocated was not suitable for everyone. He described this approach as complementary to, but distinct from traditional engineering, writing, "This branch of illuminating engineering is unquestionably an art, and only a science in so far as an art is scientific in its method."<sup>542</sup>

### **Responses from the Illuminating Engineering Society**

The attendant discussion of Jones' paper by the New York section of the I.E.S., also published in the *Transactions*, offers a compelling account of the dissent that rippled through the group around several key assertions. Clearly demonstrating respect for Jones and the value of his paper, E. L. Elliot, section Chairman and *Illuminating Engineer* publisher, commented that the audience had just listened to "probably the most important paper that has been presented before the New York Section of the Society."<sup>543</sup> Suggesting that his praise was not to be taken as "routine compliment," Elliot offered his support to Jones, reiterating his position and urging the group to remember, "no matter what importance we may attach to

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<sup>541</sup> Ibid., 36.

<sup>542</sup> Ibid., 26.

<sup>543</sup> E. L. Elliott, "Discussion on Jones, 'The Relation of Architectural Principles to Illuminating Engineering Practice,'" *Transactions of the Illuminating Engineering Society* vol. 3, no. 1 (Jan., 1908): 37.

mathematical engineering, that no system of illumination can be called a success that is ugly or offensive to the aesthetic taste.”<sup>544</sup>

Marks, while diplomatically offering a generally supportive statement of the paper by way of opening his comments, not surprisingly quickly moved to a critique of a number of Jones’ assertions, most especially his questioning the hegemony of scientific method in illuminating engineering practice. With what some might describe as a bristling tone, he said:

I can hardly agree with Mr. Jones that the illuminating engineer who considers only the scientifically practical side of the profession is necessarily doomed to ultimate failure. There is a large field for the illuminating engineer where aesthetics is only of secondary importance: in this field the illuminating engineer may achieve success even though he does not concern himself personally with the purely artistic side of the work.<sup>545</sup>

Likewise he countered Jones’ emphasis on historically appropriate decorative design for electric lighting fixtures, suggesting that in this instance particularly the scientific methods of engineering should take precedent over aesthetics in the design sources intended for “useful light.”<sup>546</sup> However, if a fixture was being designed for “decorative illumination only” Marks allowed that the reverse could be true.<sup>547</sup> In either case, he reminded the group that the primary task of engineering was to secure the right effect in the “most economical and scientific way.”<sup>548</sup> Throughout his lengthy rebuttal, Marks demonstrated unwavering confidence in the science of illuminating engineering and the positive gains of technological progress. Not convinced by Jones’ reverence for preserving the historic quality of “old methods of lighting” with new technology, he held that, “it is the business of the illuminating

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<sup>544</sup> Elliott, “Discussion on Jones,” 37.

<sup>545</sup> L. B. Marks, “Discussion on Jones, ‘The Relation of Architectural Principles to Illuminating Engineering Practice,’” *Transactions of the Illuminating Engineering Society* vol. 3, no. 1 (Jan., 1908): 38-41, quote on pp. 38.

<sup>546</sup> *Ibid.*, 38.

<sup>547</sup> *Ibid.*, 38.

<sup>548</sup> *Ibid.*, 38.

engineer to modernized old methods and to discard them where new and better ones are available.”<sup>549</sup>

Hinting perhaps at the underlying reason for the society’s commission of Jones’ paper, Marks reserved his sharpest criticism, not for Jones’ paper, but for contemporary architectural practice and what he perceived as the fundamental inability of architects to develop architectural concepts with electric lighting in mind. Like Walker, he felt that architects all too often only considered the design of buildings in relation to daylight, and if addressing electric lighting at all, typically it was on the most superficial terms and after the fact. Articulating what would become a familiar complaint from illuminating engineers for the next half-century, Marks posited,

The architect gives a great deal of thought to the question of day-light illumination, which question usually, if not always plays a very important part in his conception of the design of the building. But does he give the same attention to the question of artificial illumination? My experience has been that he rarely considers the latter until after his building plans are complete, and then usually considers it from its aesthetic and not its engineering side.<sup>550</sup>

With final, and somewhat exasperated emphasis, he asserted that the architect must “concern himself with the engineering side of illumination if we are to make real progress in the design of interior illumination.”<sup>551</sup>

Such sentiments were echoed and debated in the other responses published following Jones’ paper, including additional remarks from Elliot and substantial commentary from J. S. Codman, Van Rensselaer Lansingh, W. S. Kellogg, and A. J. Marshall. Given the opportunity for a final rebuttal, Jones conceded many points but held firm to his conviction that aesthetic considerations were, or should be, an essential aspect of illuminating engineering. Agreeing with a number of his respondents who similarly complained about the lack of appreciation for

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<sup>549</sup> Ibid., 39.

<sup>550</sup> Ibid., 40.

<sup>551</sup> Ibid., 40.



artificial lighting among architects, Jones proposed that the problem was systemic and institutionalized by the traditions of architectural education and training:

The majority of architects do not conceive their designs at all—they draw them. In this country, at least, they share with the engineer a vast inadequacy of education, and if they go abroad they have the last sparks of original genius stamped out in the suffocating atmosphere of the “schools.” In sympathies and ideals America is distinct and she, therefore, possesses the essentials of a distinctive art—an art, however that is at present crushed by the flood of importations. It is because of this lack of a true developed architecture that we are so often groping in the dark, and if the architect himself cannot direct the engineer then the engineer must direct himself, and so I plead for consideration of architectural principles. The engineer must learn to appreciate and understand the architect’s view point.<sup>552</sup>

Jones’ suggestion that illuminating engineers should “direct” themselves as a response to the inadequacies of American architectural education and practice could not have won him much favor with architects. However undiplomatic Jones’ comments may have seemed, such a crisis of faith regarding the vitality and integrity of architectural practice in the United States was building in this period, and certainly it was a sore point among the illuminating engineering community. The struggle for agency within the design of the built environment after the introduction and popularization of electric lighting pitted architects against illuminating engineers, and only exasperated such tensions. Misunderstanding and suspicion abounded on both sides, hampering progress towards settling the terms of engagement between these two disciplines.<sup>553</sup>

In the decade following the publication of Jones’ paper there was tremendous growth in the development of semi-indirect and indirect lighting systems, which placed further demands on the architectural design process, requiring suitable architectural surfaces for the reflection and diffusion of light as well as architecturally integrated systems.<sup>554</sup> Through their

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<sup>552</sup> Bassett Jones, Jr., “Discussion on Jones, ‘The Relation of Architectural Principles to Illuminating Engineering Practice,’” *Transactions of the Illuminating Engineering Society* vol. 3, no. 1 (Jan., 1908): 59-66, quote on 64.

<sup>553</sup> See for example, Rogers, “Light-Minded Architecture.”

<sup>554</sup> Marks suggested that within the first ten years of the life of the I.E.S. the industry had witnessed the shift from the predominate use of local lighting to an environment where “general illumination [was] the rule rather

conferences, publications, and educational programs, the I.E.S. encouraged their members to acquire an understanding of architectural design principles, recognizing that this was a fundamental context in which the profession necessarily operated. As Marks indicated in his annual address marking the tenth anniversary of the society:

A big field is still before us in acquiring and disseminating knowledge of the architectural and decorative requirements of illuminating design; in laying the foundation of college courses in illuminating engineering and courses for practitioners.<sup>555</sup>

Who was to teach whom, and how and where the planning of electric lighting was to enter into the architectural design process was yet to be determined, and would remain a question of great concern for the community for much longer than Marks could have imagined.<sup>556</sup>

### **Steinmetz and the Scope of Illuminating Engineering**

As a discipline and profession with centuries of history and tradition, architecture had good reason to hold a cautious stance towards illuminating engineering. While the illuminating engineering community decried the architectural profession for all but ignoring electric light in the design process, a number of prominent architects expressed concerns about the appropriate architectural uses of electric lighting.<sup>557</sup> While the boundaries of architectural practice were well established, the young discipline of illuminating engineering was still grappling to define its scope well into the twentieth century, an issue that only exacerbated the situation. This ambiguity complicated the debates concerning the place of electric light in architecture and architectural practice.

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than exception.” L.B. Marks, “Tenth Anniversary of the Illuminating Engineering Society,” *Transactions of the Illuminating Engineering Society* vol.11, no. 6 (1916): 593-600.

<sup>555</sup> Ibid., 599.

<sup>556</sup> The question of what constitutes appropriate education and training for lighting designers remains a subject of debate even today. For a summary of recent discussions within the profession regarding this issue see, Jean Sundin, “Architectural Lighting Fundamentals,” *Architectural Lighting* (2008)

[http://www.archlighting.com/industry/reports/architectural-lighting-fundamentals\\_o](http://www.archlighting.com/industry/reports/architectural-lighting-fundamentals_o)

<sup>557</sup> For example, see the account of architect, H. F. Kellogg’s talk for the American Institute of Architects, “Lighting Engineer and Architect are Urged to Cooperate,” *The Christian Science Monitor*, February 26, 1932, 2.

The esteemed mathematician and chief consulting engineer for General Electric, Charles P. Steinmetz, attempted to define this territory in a paper published in the I.E.S.'s *Transactions* in 1916.<sup>558</sup> As Marks had done in his inaugural address for the I.E.S. a decade earlier, Steinmetz defined illuminating engineering very broadly, suggesting it was “not engineering merely in the narrow sense of electrical and mechanical engineering,” but rather that it was a discipline with far reaching scope and potential for significant human impact and benefit within the built environment.<sup>559</sup> His methodical mapping of the varied and interrelated areas of concern and expertise held within the scope of illuminating engineering warrants quoting at length:

[Illuminating engineering] represents a problem in the application of physics, that is, engineering, to the design and construction of a lighting installation. But the product of the installation is light, and light is the physiological effect of radiation on the human eye, and the efficiency of the illumination thus comes into the realm of physiology as well as engineering. The psychological effect of the physiological phenomenon of light is what very largely determines the satisfaction of an illumination, and thus the psychologist becomes interested...The abuse of light, the defects of illumination, become of interest to the ophthalmologist. Light, especially certain forms of it, exerts a powerful effect on living tissue, and thereby becomes of value in sanitation, in medicine and therapeutics.<sup>560</sup>

In tracing illuminating engineering from physics through physiology, to its psychological effect and medical application, Steinmetz called attention to the distinct challenge of working with light, offering perhaps the best argument to that date for why the discipline needed to be so broadly defined. Arguably the most interesting and original aspect of Steinmetz's discussion of illuminating engineering was his acknowledgment of the human eye as the ultimate object of the lighting design process. Unlike the tools and foci of other branches of engineering he argued, “The eye is not a physical instrument, its scale is the logarithmic

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<sup>558</sup> On Steinmetz, see Ronald R. Kline, *Steinmetz: Engineer and Socialist* (John Hopkins University Press, 1992).

<sup>559</sup> Steinmetz, “The Scope of Illuminating Engineering,” *Transactions of the Illuminating Engineering Society* vol.11, no. 6 (1916): 625-628.

<sup>560</sup> *Ibid.*, 625-26.

scale, and not the algebraic scale of most physical instruments.”<sup>561</sup> As a mathematician he understood the great difficulty of attempting to formulate precise solutions for the exponential complexities of the human eye. While others had touched upon such issues prior to Steinmetz’s paper, the holistic manner in which he established the connection between the calculation of light, the application of light, and the perception and experience of the luminous environment was exceptional. Yet while he claimed illuminating engineering needed to embrace or at the very least provide communication between many branches of science and the arts, he echoed his contemporaries in prioritizing the need for architecture, decoration, and lighting to be developed in partnership. He proposed:

The success of an illumination depends not merely on the location and size of the light sources, but equally on the architectural structure of the building, on the decoration of the walls and ceilings, etc., and hence the architect’s and the decorator’s work is of importance in the success of illumination.<sup>562</sup>

Although Steinmetz’s vast and webbed definition of illuminating engineering included physics, physiology, psychology, architecture, decoration, ophthalmology, bacteriology and therapeutics, in his final assessment he acknowledged that, “the design of a successful illumination begins with the plans of the architect.”

### ***Architecture of the Night: Cause to Collaborate***

Such an acute awareness of the fundamental need for cooperation between architects and illuminating engineers also characterized the rhetoric found in the electric industry’s marketing of new architectural lighting technologies, which is predictable given the industry as a whole stood to gain the greatest financial benefit from improved collaboration and communication between the disciplines. Pragmatically, one might argue that indeed, the most productive inroads into the architectural market for the electric industry and manufacturers of

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<sup>561</sup> Ibid., 626.

<sup>562</sup> Ibid., 625.

architectural lighting equipment were promised by broader and earlier inclusion of illuminating engineers into the design process. A less impactful strategy, but valuable nonetheless, was the promotion and dissemination of greater knowledge of the principles of electric lighting among architects. Pursuing both approaches, the industry invested substantially in education and marketing programs aimed at raising awareness of the requirements of electric lighting within the architectural community throughout the 1920s, while also supporting efforts aimed at increasing knowledge of the principles of architectural design among illuminating engineers.<sup>563</sup> General Electric's 1930 publication, *Architecture of the Night*, is a notable example of such efforts, demonstrating the increasing recognition of shared interests among architects and lighting professionals in the early 1930s. The frontispiece of the slender booklet captured the effort to wed architecture and electric lighting technology, featuring a dramatic nighttime photograph of Detroit's floodlit Fisher Building, upon which was inset a photograph of G.E.'s Novalux floodlighting projectors.<sup>564</sup>

Inside the booklet, General Electric produced testimonials and predictions regarding the present use and potential development of architectural illumination from three prominent architects, Raymond M. Hood, Harvey Wiley Corbett, and George Rapp—all early adopters of architectural floodlighting. G.E.'s director of illuminating engineering, Walter D'Arcy Ryan, contributed the fourth and final essay representing both the electric industry and lighting specialists. As the booklet's title suggests, the focus of the essays was largely on facade illumination and the promotion of a new luminous nocturnal architecture made possible with G.E.'s powerful floodlights and projectors. The new "architecture of the night" announced by G.E.'s booklet was set exclusively within an urban context where skyscrapers provided high profile canvases for electric illumination. While this was but one area of

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<sup>563</sup> On the efforts of American electrical providers to forge better cooperation between architects and illuminating engineers in the 1920s and 30s, see Neumann, in Neumann and Champa, 55-60.

<sup>564</sup> *Architecture of the Night*, General Electric Company, Bulletin GED-375 (Feb., 1930).

intersection between architects and illuminating engineers, it was a topic of great interest in the 1930s as commercial towers quickly rose in the nation's metropolitan areas, offering significant financial opportunities for all involved. Equally important, the skyscraper further represented an example of an indigenous modern American architecture, and as such, offered an appealing response to concerns raised, as early as the first decade of the century, about the absence of any satisfactory tradition of building in the United States. And intrinsic to the imaging of the American skyscraper was its towering nighttime illuminated presence—a factor no doubt encouraged by G.E.'s efforts. Writing for *The Nation* in 1931, the architectural critic Douglas Haskell, made this connection emphatically clear, proclaiming, “It is the habit to speak of a ‘modern manner’ as if there were just one, but already it is divided right down the middle. The Europeans get the Day; we get the Night.”<sup>565</sup> Challenging those that might doubt his claim, Haskell invited readers to look out at the illuminated architecture of the modern American city and defy his assertion:

If you are a city dweller these pictures can be verified in daily life. Sitting here, for example, looking out across the East River at the old rock pile of New York, you will find it unquestionably most beautiful at night, with the thousands of lights. Whatever chaos there may be in the forms disappears in the uniform grill of this star-spangled banner, and patriotism catches at the throat. Here is modernism indeed. Thousands of years went by with their changes of style, but not until this century was there electric light, which, far, far more than the familiar triad of steel, glass, and concrete, has changed the basis of all architecture. This is us.<sup>566</sup>

If, as Haskell claimed, night was the context in which modern American architecture was to be finally realized, as exemplified by just such images as those reproduced in *Architecture of the Night*, then the urgency to foster collaboration between architecture and illuminating engineering had arguably never been greater. Despite such enthusiasm for this new, nocturnal American architecture, many of the arguments and criticisms captured in the essays collected within *Architecture of the Night*, were far from original and were much more

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<sup>565</sup> Douglas Haskell, “Architecture: the Bright Lights,” *The Nation* 132, January 14, 1931, 55-56.

<sup>566</sup> *Ibid.*, 56.

closely related to the long-standing concerns in circulation since the first decade of the twentieth century.<sup>567</sup>

Corbett, one of the nation's more prominent architects designing skyscrapers and advocating for the role of tall buildings in advancing modernism in the United States during the 1930s, was the second architect featured to G.E.'s booklet, offering his advice on "designing buildings for night illumination."<sup>568</sup> Setting the context for his recommendations, Corbett began with a familiar lament regarding the plight of the architect in the face of ever changing architectural technologies. Describing the frustration he and many of his colleagues felt when faced with yet another technological innovation, he wrote,

The troubles of the poor architect never diminish, but only multiply. Just when he thinks he has mastered the principles of the architecture of the Ancients, a whole lot of new commercial and mechanical problems are thrust upon him and he has to revamp all his ideas of architectural form, proportion, and mass to meet the practical needs of the day.<sup>569</sup>

Having likely gained the sympathy and attention of his fellow architects with this opener, Corbett then proceeded to address the very same challenge that Walker had identified in 1907 in "Electric Light as Related to Architecture"—that is, the problem of designing architecture for both day and nighttime illumination. Continuing in the guise of the long-suffering architect, he described how after:

Having design his architecture, cornices, mouldings, and details with due regard for an angle of sunshine falling from above at 45 degrees over the left shoulder, [the architect] now finds himself confronted with beams of night light shooting upward at a dozen different angles, completely reversing his entire design problem so that every carefully studied shadow becomes a highlight and every studied proportion is turned upside down.

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<sup>567</sup> These issues characterized debates within the illuminating engineering community throughout the later 1920s and 30s, see for example, C.E. Weitz, "Light and Architecture Merge Resources," *Light* (April, 1929): 7-9; "Cooperation as One Architect Sees It: An Interview with William Van Alen," *Electrical World*, vol. 95, no.11(1930): 539-540; and "A Basis for Cooperation between the Architect and the Illuminating Engineer," *Transactions of the Illuminating Engineering Society*, vol. 25, no. 5 (1930): 461-469.

<sup>568</sup> "Corbett Advises Designing Buildings for Night Illumination," *Architecture of the Night*, General Electric Company, Bulletin GED-375 (Feb., 1930), not paginated. On Corbett, see Carol Willis, "Zoning and "Zeitgeist": The Skyscraper City in the 1920s," *Journal of the Society of Architectural Historians* 45.1 (1986): 47-59.

<sup>569</sup> "Corbett Advises Designing Buildings for Night Illumination."

Then Corbett called out the elephant in the room, asking a question less frequently raised particularly by illuminating engineers or the lighting industry, by inquiring “can we design our building to be equally effective for the eight or ten hours of daylight and at the same time be architecturally satisfactory for a few hours of specially illuminated night time?”<sup>570</sup>

Answering his own question, Corbett made an argument, surely pleasing to G.E., for the absolute necessity of designing architecture for these “few hours.” He asserted,

From a critical point of view, more attention is given, more comments are made, more interest is aroused when buildings are artificially illuminated than during the natural daylight. Night illumination attracts attention like a spotlight on a stage. Buildings are noticed and commented on which otherwise would be passed by the casual observer without a thought.<sup>571</sup>

Despite his conviction regarding the nighttime illumination of modern architecture, Corbett made no mention of illuminating engineering or the role of such specialists in achieving satisfactory results in the all-important nocturnal appearance of buildings. Whether this was a result of the editorial trimming of his interview for the publication or another indication of the resistance within the architectural profession to recognize illuminating engineering is difficult to ascertain. However, the one and only illuminating engineer featured in *Architecture of the Night*, Walter D’Arcy Ryan, used the opportunity to try to rectify the situation, offering a simple solution for the long-suffering architect Corbett had described— consult an illuminating engineer.<sup>572</sup>

Beginning his essay with a quote from Corbett lamenting the architect’s persistent habit of leaving the planning of illumination until the final stages of the design process when it was too late to make the modifications necessary to accommodate electric lighting, Ryan argued

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<sup>570</sup> “Corbett Advises Designing Buildings for Night Illumination.”

<sup>571</sup> Ibid.

<sup>572</sup> Walter D’Arcy Ryan, “‘Night Architecture’ Will be Perfected through the Cooperative Efforts of Architect and Illuminating Engineer,” *Architecture of the Night*, General Electric Company, Bulletin GED-375 (Feb., 1930), not paginated.



that this was precisely why more careful consideration of nighttime illumination was needed during “the evolution of the building’s design.”<sup>573</sup> The well-trained lighting specialist he proposed, was “thoroughly familiar with the limitations in the design of lighting apparatus,” and able to communicate these issues “to the architect in his own language.” Furthermore, subtly challenging the creative hegemony of the architect, Ryan suggested that the lighting specialist was “competent to conceive artistic lighting effects as well as execute them.”<sup>574</sup> Offering the example of his widely-acclaimed architectural illumination of the 1915 Panama-Pacific Exposition, Ryan reminded readers that there he was entrusted with “the entire responsibility for the planning and production of the illumination” and was allowed “close cooperation with the architects” from the initial design stages.<sup>575</sup> Delving into detail on such architectural considerations impacting the performance of electric light, such as the texture and color of the material upon which light will be projected or reflected, the placement of the lighting apparatus, and architectural ornaments, Ryan labored to illustrate in very real terms the inseparability of light planning from the architectural design process.

### **Technicians or Collaborators: a Question of Recognition**

The obvious logic of Ryan’s argument for closer cooperation belied the dogged tensions between the disciplines. Returning to the perspective offered by the three architects’ contributions to *Architecture of the Night*, not one of these men refer to illuminating engineering specifically or suggest working with a lighting specialist. While each demonstrated an awareness of and appreciation for architectural illumination, and all agreed on the growing importance of the nighttime illumination of architecture, the commentary is consistently constructed in the passive voice or when presented in the first-person, the plural

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<sup>573</sup> Ryan, “‘Night Architecture’ Will be Perfected.”

<sup>574</sup> Ibid.

<sup>575</sup> Ibid.

pronoun *we* is employed. For example in the interview with Raymond Hood, which opens *Architecture of the Night*, the architect explains:

Up to the present, we have contented ourselves mainly with direct and floodlighting of varying intensity. There still is to be studied the whole realm of color, both in the light itself and in the quality and color of the reflecting surfaces, pattern studies in light, shade and color, and last of all, movement.<sup>576</sup>

There is a tacit implication that the “we” in question is the architectural profession—particularly given that Hood does not reference illuminating engineering at any point within his interview. Similarly the passive voice used to describe the need for further research into the interaction of light and color allows the association with the architect to continue. Despite Hood’s silent omission of the illuminating engineer, he relied heavily on such specialists in his own practice. While Bassett Jones collaborated closely with Hood on the design of the lighting for the Radiator Building, in his discussion of the design of the famous skyscraper’s nighttime illumination in *Architecture of the Night*, Hood reported, “When I was studying the lighting of the Radiator Building, I tried, with the help of Mr. Kliegel, a few experiments that opened my eyes to what might be done.”<sup>577</sup> It is interesting that Hood would offer some credit to Kliegel, the famous manufacturer of theatrical lighting products, but not his illuminating engineer.

Likewise, in Corbett’s essay, which features a rendering of the Pennsylvania Power and Light Building illuminated after dark, there is no mention of Walter D’Arcy Ryan, who designed the celebrated facade lighting for the skyscraper. And in addition to being absent in the text of the essay, the caption for the illustration praises “Helmle & Corbett’s effective design for the illumination of the New Pennsylvania Power & Light Co. building.”<sup>578</sup> The inequity of the omission is all the more acute given Corbett’s understanding of and

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<sup>576</sup> “Raymond M. Hood Predicts “Architecture of the Night,”” in *Architecture of the Night*, General Electric Company, Bulletin GED-375 (Feb., 1930).

<sup>577</sup> On the illumination of the Radiator Building, see Bassett Jones, Jr., “Structures in Light,” *Light* (April, 1925): 6 and Neumann and Champa, 114.

<sup>578</sup> “Corbett Advises Designing Buildings for Night Illumination.”

appreciation for architectural illumination as informed by his collaborations with Ryan, and therefore, it is not unreasonable that one would expect that some mention of their cooperation would have been included in the essay.<sup>579</sup> Given that *Architecture of the Night* was published and produced by General Electric, in partnership with *Architectural Forum* for the sole purpose of promoting architectural lighting it is somewhat surprising that it would perpetuate architecture's hegemonic subversions of illuminating engineering, but if the primary audience for the booklet was the architectural community perhaps selling light was more important than encouraging the use of lighting specialists.

It is perhaps unfair then to place blame exclusively with the architectural profession for marginalizing the role and contributions of illuminating engineers within the design process. The young discipline in defining itself so loosely and broadly, made readily identifying and promoting clear aims, methods, and expertise more difficult. Also, the suggestion put forth by some within illuminating engineering that they were more qualified and better able to both conceive and execute aesthetic effects than architects, challenged the predisposition within architecture to see such specialists as consulting technicians, not as contributors to the design process. Such attitudes persisted even when architects were soliciting assistance from illuminating engineers. Reporting in 1929 on the launch of a movement supporting cooperation between architects and illuminating engineers, the *New York Times* quoted Frank C. Farley of the American Institute of Architects on the issue, who claimed:

The great architect of an epoch is he who best realizes its social state and its many manifestations. The technical man realizes in his way but cannot fully create or govern the aspirations of the time. We are borne along in a great complex movement on a wave that seems to move faster and faster...It is here that technical men and specialists must help the struggling architect.<sup>580</sup>

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<sup>579</sup> Neumann has suggested that Ryan's "collaboration with the two architects Harvey Wiley Corbett and Wallace Harrison turned them both into convinced proponents of nocturnal architectural illumination," and furthermore that Corbett's essay in G.E.'s booklet "reflected Ryan's suggestions and the recent experience of their collaboration." Neumann, "Pennsylvania Power & Light Company Building," in Neumann and Champa, 124.

<sup>580</sup> "Architects Ask Aid in Illumination Field," *New York Times*, February 17, 1929, 32.

While there was clearly growing respect for the contributions of such “technical men,” such entrenched attitudes remained prevalent within architectural practice. However, the onus was on the illuminating engineering community to earn recognition for the discipline as a design profession. The I.E.S. sought to address the situation by forming a National Committee on Light in Architecture and Decoration. In a short editorial appearing in the I.E.S.’s *Transactions* in 1933, A. L. McCabe, a Light in Architecture and Decoration committee member, described the stumbles and advances made by both architecture and illuminating engineering in the first three decades of the century. McCabe proposed that following this period of experimentation and refinement, “modern architecture has reached a more fully developed stage, and the engineer has had an opportunity to test out theories in actual practice,” which was resulting in “many more examples of rational treatment.”<sup>581</sup> Even with increased knowledge of the requirements of architectural lighting however, McCabe argued that while the contemporary architect was able to “visualize the effects he is desirous of securing” he was inadequately “conversant with the technique of light application to determine the details of equipment design.”<sup>582</sup> Defining distinct roles for each professional in the design process, McCabe described typical failed results where “the architect has insisted on a certain method of illumination against the advice of the engineer.”<sup>583</sup> The architect, McCabe claimed, was to be entrusted with the lighting concept alone, because the lighting engineer,

who has equipped himself with the necessary understanding of illumination problems as applied to architectural work is unquestionably in a much better position to suggest a system of illumination most consistent with the design characteristics and functional requirements.<sup>584</sup>

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<sup>581</sup> A. L. McCabe, “Light and Architecture: Lighting Engineers have Become More Expert in Planning Modern Lighting,” *Transactions of the I.E.S.* vol. 28, no. 3 (Feb., 1933): 106-107.

<sup>582</sup> *Ibid.*, 106.

<sup>583</sup> *Ibid.*, 106.

<sup>584</sup> *Ibid.*, 106-107

In summary, McCabe raised the issue of the worsening economic climate as the nation settled into the Depression, suggesting that the “one redeeming feature” of the situation was that it offered the average engineer more time to “devote to acquiring a greater appreciation of the requirements of his profession.”<sup>585</sup> In using idle time to develop deeper knowledge of the principles involved in the application of electric light to modern architecture, McCabe predicted that “illumination consultants” would be “rewarded by a position of greater prestige on the return of normal business conditions.”<sup>586</sup> It is telling that the potential benefit of the extended period of research and reflection imposed by the Depression according to McCabe, was “greater prestige” for the discipline. Despite the growing importance of illuminating engineering to modern architectural practice, it would seem that insecurity about the acknowledged status of the profession was a persistent issue within the community.

### **Illuminating Engineering: a Profession or Trade**

McCabe’s prediction turned out to be at least partially correct. During the austerity of the Depression the electrical supply and lamp manufacturing industry focused its efforts on research and development, which resulted in an array of new, brighter, and more efficient lighting technologies.<sup>587</sup> Furthermore, as discussed in Chapters 2 and 3, popular interest in the possibilities of electric light across a variety of contexts and applications continued unabated. However it is more difficult to assess how or if this period also contributed to any growth in professional confidence among illuminating engineers, or increased recognition for the discipline, particularly within architectural practice. The slowdown in the construction sector during the lean years of the Depression, which limited professional opportunities for illuminating engineers, was extended by the outbreak of World War II and the subsequent

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<sup>585</sup> Ibid., 107.

<sup>586</sup> Ibid., 107.

<sup>587</sup> See Neumann, “‘Architecture of the Night’ in the U.S.A.,” in Neumann and Champa, 62-63.

restrictions placed on energy, material, and construction during United States involvement in the war. But as highlighted in Chapter 3, the future for the electric industry and the lighting profession looked decidedly rosier towards the end of the war, with the anticipation of a significant building boom and surging consumer economy in the immediate postwar period. Given this optimism, it was perhaps a surprising time for a scathing critique of the Illuminating Engineering Society and its standing as a professional society to come from one of its own members, H. H. Higbie, a professor of Electrical Engineering at the University of Michigan. In a paper authored for the I.E.S.'s *Transactions*, and an unusual paper for the society's journal by any measure, Higbie put forth a controversial indictment of the forces of commercial interest within the organization that drew extended comment and criticism.

Published in July of 1945, just two months before the United States would drop atomic bombs on the Japanese cities of Hiroshima and Nagasaki, Higbie's call for higher professional standards and ethics within the illuminating engineering carried a newfound urgency. His chief concern was the broad membership of the society and the lack of controls or regulation over the industry's powerful corporate interests within the society. Attacking the fundamental conditions of the I.E.S.'s constitution, Higbie lamented that: "A need has long existed for some valid distinction between those whose interest in lighting work is technical and professional, and those whose interest is merely commercial or managerial."<sup>588</sup> With the use of the modifier "merely" he immediately distinguished between those he believed could constructively contribute to the advancement of the profession, and those who he believed would only continue to hinder its development and professional standing. While he applauded several recent changes within the society, including implementation of a membership grade of Fellow, distinguishing between recognized illumination specialists and non-technical members, the establishment of an Illuminating Engineering Research Fund,

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<sup>588</sup> H. H. Higbie, "Illumination Engineering, a Profession," *Transactions of the I.E.S.* vol. 40, no. 2 (July, 1945): 414-420.

and other initiatives aimed at defining standards of best practice among professional members, Higbie argued that a shared ethical code was missing. Further dividing his audience, he wrote, “this discussion is not for those who are content to be engaged in merely lighting business...but rather, it is for those who aspire to be members and representative of a lighting profession.”<sup>589</sup> To demonstrate the distinction between a trade or a business and a profession, Higbie quoted Dr. W. E. Wickenden, President of the Case School of Applied Science, at length:

The marks of a profession include not only a body of knowledge and an elaborate technique, but also a clear and articulate conception of social function and duty...In these respects law, medicine, architecture and the religious ministry hold a more advanced position in the professional scale than does engineering. It is, in fact, this more definite sense of function and duty, rather than any superiority in science and technique which invests them with a seeming social and intellectual superiority.<sup>590</sup>

This was a convenient definition for engineers, particularly in its provision for increased prestige and closer professional equivalency with architecture through the development of greater social responsibility. Placing emphasis on commitment and accountability to “colleagues, clients, and to the public” and a shared code of ethics prizing “service above gain, excellence above quantity, self-expression above pecuniary incentives, and loyalty above individual advantage,” Higbie set forth what he believed to be the standards for a true profession of illuminating engineering.<sup>591</sup> His insistence on such altruistic qualities was a response to his perception of contemporary illuminating engineering as functioning largely in service of industry “monopolies and cartels” rather than the public good.<sup>592</sup> In particular, he was concerned with the lack of progress towards more efficient light production, claiming, perhaps most ominously, a “conspiracy of silence” regarding the failure to develop such

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<sup>589</sup> Higbie, “Illumination Engineering, a Profession,” 414.

<sup>590</sup> Higbie quoted from the Final Report on Investigation of Engineering Education 1923-29, vol. 2, (1934): 1044, published by the *Society for the Promotion of Engineering Education*. See Higbie, “Illumination Engineering, a Profession,” note 1, 418.

<sup>591</sup> *Ibid.*, 414-415.

<sup>592</sup> *Ibid.*, 416.

technologies in a timely manner.<sup>593</sup> He argued that while in 1908 there was a “brisk evolution” in lamp development, progress quickly slowed through patent control and commercial policy that facilitated corporate interest in “getting all possible profit out of a poor old idea before starting effectively to develop a better new idea.”<sup>594</sup> While much had been made in the nation’s newspapers of record as well as in industry journals of the exponential improvements in lamp efficiency and in the production and distribution of electricity since the turn of the century, Higbie suggested that such reports were half-truths emphasizing gains rather than questioning why better methods and technologies had not been developed.<sup>595</sup>

### **Conspiracy and Combination: a Crisis of Ethics**

Immediately and sharply contested, it would seem Higbie’s criticisms were in fact valid and probably more accurate than some in the I.E.S. were inclined to admit. From the latter part of the nineteenth century General Electric had pursued an aggressive policy of patent control over the incandescent lamp and the tungsten filament, which was challenged unsuccessfully by the Westinghouse Electric Company in 1892 in the United States Circuit Court of Appeals.<sup>596</sup> A similar lawsuit was pursued again the following year by Westinghouse against General Electric over the “feeder and main” patent that allowed municipal lighting by incandescent lamps, as well as other situations requiring multiple lamps distributed over a larger area, as most prominently demonstrated at the nation’s world’s fairs and exhibitions.<sup>597</sup>

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<sup>593</sup> Ibid., 417.

<sup>594</sup> Ibid., 417.

<sup>595</sup> See for example, “Light Volume Gains as Prices Decline,” *The Washington Post*, July 10, 1927, F7 and Aaron Hardy Ulm, “Electric Power and National Politics,” *Barron’s* 7, 46, Nov. 14, 1927, 5.

<sup>596</sup> “Edison Again Successful: His Incandescent Lamp Patent Has Been Infringed,” *New York Times*, December 16, 1892, 9; “A Most Dangerous Trust: Some Allegations as to the General Electric Company,” *New York Times*, November 19, 1892, 5.

<sup>597</sup> As Westinghouse suggested to *New York Times* reporters, “The Edison companies...put in grossly exorbitant bids [for the contract to furnish the incandescent lighting for the Chicago World’s Fair], which they sought to force Directors into accepting on the grounds that under the expected decision of the courts they alone would be



Once again, the case was decided against Westinghouse, confirming the strength of General Electric's patent, as well as the company's control of the industry.<sup>598</sup> The industry as a whole came under investigation in 1910, resulting in the United States government charging the National Electric Lamp Company with conspiracy and unlawful combination in 1911. With seventy-five percent ownership held by General Electric, the National Electric Lamp Company was controlled by G.E. with the remaining shares belonging to Westinghouse and thirty-five other industry concerns. Westinghouse had entered into partnership with G.E. through the association in 1901, following the company's unsuccessful challenge of G.E.'s patent abuses. As a single entity, the association was accused of controlling an estimated ninety-seven percent of the country's supply of electric lights.<sup>599</sup> Described as "one of the most powerful and complete monopolies in the country," Attorney General George W. Wickersham charged the National Electric Lamp Company with "having obtained control of [incandescent] lamp output and fixed prices, allotted business and prescribed rates of sale for its members."<sup>600</sup> Operating under cover of patent law, General Electric, as the controlling interest in the National Electric Lamp Company, was able to secure contracts with foreign corporations as well, "forestalling the possibility of any competition whatever."<sup>601</sup>

Despite a number of similar high profile lawsuits around patent control and infringements and multiple claims of conspiracy and collusion, the industry and the profession of illuminating engineering refused to accept such accusations or to provide any mechanism for self-censorship. Given the stubborn denial of what appeared to be serious challenges to the industry's ethics, it is not surprising that a number of individuals responded

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permitted to make incandescent lamps, and said that unless they got the contract for the lighting they would decline to furnish the necessary lamps to the successful bidder." "A Most Dangerous Trust," 5.

<sup>598</sup> "Edison Wins a Great Electric Case: Judge Green Decides the Feeder," *Chicago Daily Tribune*, March 29, 1893, 4.

<sup>599</sup> See, "Taft to Prosecute Big Electric Trust," *New York Times*, December 27, 1910, 5; "Suit to End Trust," *The Washington Post*, March 4, 1911, 3; "Trust Must Dissolve: Government Wins Suit Against General Electric," *The Washington Post*, October 13, 1911, 4.

<sup>600</sup> "Electrical Trust Under the Probe: Unlawful Combination and Conspiracy Charged," *The Atlanta Constitution*, March 4, 1911.

<sup>601</sup> "Electrical Trust Under the Probe."

to Higbie's paper with irritation, suggesting his account of the profession was an inaccurate exaggeration at best. The attendant discussion was published in two parts, first, following the paper and second, a half-year later following the decision of the I.E.S.'s Committee on Papers to share further rebuttals, including a response from Higbie to his critics.<sup>602</sup>

Although he cited many sources in his paper, the majority of the texts he referenced were not taken from industry or scientific papers, but rather from the liberal magazine *The Progressive* and the leftist daily newspaper *PM*. Higbie's critics noted the reliance on "popular writers and politicians" rather than engineers to make his case, suggesting that his paper was little more than a "collection of quotations and expressions of opinion."<sup>603</sup> However it would seem that the unusual nature of his argument and his clear anti-corporate stance would have made finding evidence within industry and professional publications closely tied to industry interest difficult.

Dr. Albert Hull of General Electric's Research Laboratories provided the most scathing critique of Higbie's paper, as might be expected given his accusations. Although agreeing that progress in the industry may have been slow by some standards, Hull suggested this was only in comparison to ideals, and that it "wasn't due to any lack of go-ahead orders."<sup>604</sup> Rather, he proposed that he and his research team at G.E. had sustained "excellent Company backing, and plenty of prodding," claiming that, "we simply did the best we could."<sup>605</sup> In response to Hull's remarks, Higbie offered a specific example of what he claimed was purposely misguided research. He maintained, "My point here was, and still is, that the profits taken through grossly inefficient hot-wire lamps should have been much more largely devoted than they were, to finding a better lamp, in the interest of the public which provided

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<sup>602</sup> "Discussion: Illuminating Engineering—A Profession," *Illuminating Engineering* vol. 41, no. 3 (March, 1946): 248-260.

<sup>603</sup> Dr. Albert W. Hull, "Discussion of 'Illumination Engineering, a Profession,'" vol. 40, no. 2 (July, 1945): 420-422; John O. Kraehenbuehl, "Discussion: Illuminating Engineering—A Profession," *Illuminating Engineering* vol. 41, no. 3 (March, 1946): 248.

<sup>604</sup> Hull, "Discussion," (July, 1945): 420.

<sup>605</sup> *Ibid.*

those profits.” Proposing that most innovations in light production and efficiency, including the tungsten filament lamp, neon lamp, and cold cathode tube, were in fact first developed abroad and only adopted after a period of resistance from the electric industry in the USA<sup>606</sup> he contended, “When the decision was made forty years ago by those responsible for policy, to develop hot-wire lamps rather than arc lamps, it was well known by scientist and engineers that getting light from incandescent bodies was as inefficient as burning down a house to roast a pig.”<sup>607</sup> Higbie argued that the industry’s leading scientists and engineers, by not speaking out against such policies, were complicit in the industry’s efforts to only promote and develop technologies of greatest financial benefit to its controlling corporations and its partners, at the expense of consumer benefit.

Again referring to other respected professions, Higbie proposed, “why should a competent engineer who speaks out courageously against abuses he knows to exist, have to be afraid that such action may adversely affect his professional future, while an able lawyer may take like action in full confidence that the very businesses which he denounces may at some later time pay highly for his professional services without prejudice?”<sup>608</sup> John O. Kraehenbuel, a professor of electrical engineering at the University of Illinois, also responded to Higbie’s paper, similarly suggesting that it was the duty of the individual engineer to stand up against unethical corporate practices. He argued,

The ideal professional behavior does not depend upon an organization, but upon the individual...The ideals of the profession are high, but only when individuals who follow these ideals are gathered together in an organization do we have a professional organization which is ideal.<sup>609</sup>

However, achieving such ideals within the Illuminating Engineering Society was complicated by its membership and management, which included a large percentage of researchers,

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<sup>606</sup> Higbie, “Discussion,” 256.

<sup>607</sup> Ibid.

<sup>608</sup> Higbie, “Illumination Engineering, a Profession,” 416.

<sup>609</sup> Kraehenbuehl, 248.

engineers, and managers employed by General Electric, Westinghouse, and the other commercial interests and utilities that controlled the electric lighting industry.

### **The Fluorescent Lamp: a Case Study in Collusion**

Pointing to the recent development of the florescent lamp, Higbie suggested that all of the lamp's prerequisite elements were known for over thirty years before its introduction in the USA, which he posited was further proof of insufficient priority being given to technologies that could potentially reduce energy consumption. Quoting from documentation prepared by the Justice Department for the United States Senate Patents Committee, he argued that there was convincing evidence supporting claims of collusion between the energy supply and lamp manufacturing industries to suppress such developments. Excerpting a letter from a representative of the energy supply industry to a member of the lamp manufacturers' trust, Higbie offered his most provocative evidence. The letter, which addressed the promotion of new fluorescent lighting applications at the 1939 New York World's Fair, suggested the existence of agreements between the two industries over this technology. In the letter Higbie reproduced, an unnamed energy supply industry representative wrote:

I think [the demonstration of fluorescent lamps at the fair] does violate the spirit of the understanding that our group had in Cleveland. As a matter of fact, I would think it violated the fundamental concept of the lamp department that advances in the lighting art should not be at the expense of wattage, but should give the customer more for the same money.<sup>610</sup>

Claims that the electric lighting industry was purposefully suppressing technologies that would reduce energy usage were common throughout the legal battles over fluorescent lamp patents and other clandestine actions taken by the electric industry throughout the 1940s. Beginning in the spring of 1942, for example, the United States Department of Justice's anti-trust division stepped forward as an intervening defendant in a patent infringement action

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<sup>610</sup> Higbie, "Discussion," 259.

brought to Federal Court by General Electric against the Hygrade Sylvania Corporation. The government's counsel contended that General Electric, through license agreements, was able to fix the quantity of fluorescent lamps manufactured in the United States and to establish agreements with foreign companies for the import and export of fluorescent equipment, thereby securing its dominance in the market—just as it had done at the turn of the century. General Electric responded, claiming the government did not have the right to intervene in a patent infringement action.<sup>611</sup> The case escalated and in mid-August, Justice Department attorney, John W. Walker accused General Electric, Westinghouse Electric, and more than 100 public utilities of operating together to “retard the development of fluorescent lighting throughout the country because it requires only one-third to one-half the current required for incandescent lighting.”<sup>612</sup> The collusion was exposed during the patent infringement case General Electric had brought against Hygrade Sylvania. As Walker argued, “The principal factor that made it impossible for General Electric and the utilities to completely retard and control the development of the fluorescent lighting industry was the aggressive promotion of fluorescent lighting by an independent manufacturer, the Hygrade Sylvania Corporation, and the activities of this independent are the only barrier existing today to General Electric, Westinghouse and the utilities getting absolute control of the new industry and operating it solely in conformity with their own interests.”<sup>613</sup>

Suggesting even higher levels of influence and collusion, Walker called attention to a puzzling situation wherein the United States Army and Navy had ordered a stop of the antitrust suit against General Electric the previous year, on the grounds that it would hamper the war effort by draining G.E. officials' time and resources. However the government made no attempt to stop General Electric's patent infringement suit against Hygrade, despite the

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<sup>611</sup> “Justice Department Seeks to Intervene in Patent Litigation,” *The Hartford Courant*, May 26, 1942, 16.

<sup>612</sup> C.P. Trussell, “Charges Utilities Retard New Light: Walker of Biddle Staff Tells Senators Fluorescent is Hampered as Cheaper,” *New York Times*, August 19, 1942, 13.

<sup>613</sup> *Ibid.*

fact that this complicated case similarly demanded great attention from the company during the same period as the antitrust suit.<sup>614</sup> Senator Homer T. Bone, committee chairman, complained with exasperation, “This situation has no rational explanation. The government is entitled to have access to its own courts to try this same issue, but this right is denied. It is a weird picture. It is mumbo jumbo.”<sup>615</sup>

In December General Electric, Westinghouse, and the affiliated utilities implicated in the suit were formally charged with monopolizing and restraining trade in fluorescent lamps and fixtures by allegedly dividing the world market, conspiring with utility companies, controlling prices, and making unlawful use of patent licensing agreements and agency contracts.<sup>616</sup> Yet, even in the face of such condemnation, many individuals within the electric and illuminating engineering communities defended the actions and motives of the industry’s largest corporations. Shortly after the announcement of the fluorescent lamp anti-trust investigation, Frank E. Watt, an electrical engineer with numerous patents himself, wrote a letter to the editor of the *New York Times*, as he claimed, “in the interest of fair play.”<sup>617</sup> Watt argued that the government had exaggerated and misconstrued facts, and suggested that there was ample evidence that electric utilities had continuously lowered the price of their service for the benefit of consumers and that they had “aggressively promoted the sale of fluorescent lighting.”<sup>618</sup> Furthermore, he proposed that General Electric and Westinghouse were “wrongly accused,” and that these companies and their extensive research laboratories had supported “patient, costly research and engineering development resulting in radically lowered costs of bulbs.” However, Watts exposed his allegiances using familiar industry rhetoric when he defended their actions regarding the suppression of fluorescent lighting,

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<sup>614</sup> Edward Ryan, “Services Halt G.E. Trust Suit, Senators Hear,” *The Washington Post*, August 19, 1942, 4; “War, Navy Departments Criticized for G.E.’s Suit Against Hygrade,” *Wall Street Journal* August 19, 1942, 6.

<sup>615</sup> “Charges Utilities Retard New light.”

<sup>616</sup> “Fluorescent Industry Charged with Monopoly,” *The Wall Street Journal*, December 10, 1942, 4; “United States Accuses Ten in Fluorecent Lamp Industry,” *Chicago Daily Tribune*, December 10, 1942, 40.

<sup>617</sup> Frank E. Watt, “Letters to the Times,” *New York Times*, August 27, 1942, 18.

<sup>618</sup> Watt, “Letters to the Times,” 18.

suggesting that the aim was “not less cost for electricity but more light for the same money”—a phrase seen again and again in industry generated documents, such as that Higbie produced in defense of his claims.<sup>619</sup> Casting suspicion instead towards the government, Watt argued,

These charges fall in the same category as those leveled at other industries in recent months. There is a growing suspicion that there is a deliberate attempt to discredit industry on the part of certain government agencies... Today industry is tried and condemned by committee hearings. There is no chance for rebuttal and free enterprise is in grave danger.<sup>620</sup>

In January of 1949, four years after Higbie published his paper, General Electric, Westinghouse, and a number of others within the lamp manufacturing industry were found guilty of violating the Sherman Anti-trust Act.<sup>621</sup> Higbie’s diatribe against those members of the I.E.S. who failed to uphold professional standards of ethical and socially responsible practice resonates more deeply against this backdrop. A remarkable claim for both its honesty and isolation, he charged that the profession had:

...left it to eminent representatives of the legal profession...to initiate movements for protection of the public against demonstrably real dangers of monopolies and cartels, business supergovernments, which operate even in our own field of work and of which we should have been cognizant long ago.<sup>622</sup>

The discipline’s overall compliance with the industry’s agenda has had lasting implications. Whether or not the I.E.S. wanted to admit it, its members were complicit in the industry’s control of the market through commercial combination and patent abuses, suppression of technologies and innovations that posed a threat to its control or profits, and efforts to ensure continued growth of domestic energy consumption in making lamps brighter, and therefore “more efficient,” without reducing watt usage. Higbie may have hit a nerve with his claims

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<sup>619</sup> Ibid.

<sup>620</sup> Ibid.

<sup>621</sup> “G.E., Westinghouse, Other Lamp Makers Guilty of Monopoly,” *Wall Street Journal*, January 20, 1949, 4. On this period, see Leonard S. Reich, “Lighting the Path to Profit: GE’s Control of the Electric Lamp Industry, 1892-1941,” *Business History Review* vol. 66, issue 2 (1992): 305-334.

<sup>622</sup> Higbie, “Illumination Engineering, a Profession,” 416.

among the society's members, but it did not have lasting effect, and his questioning of the ethical standards of the profession would not be addressed in any sustained or considered way for another quarter century.

### **Lighting Design Consultants: an Independent Profession**

In the early postwar period, as the construction industry and the consumer economy flourished, such polarizing debates about cartel and monopoly practices within the illuminating engineering community quickly died away. Instead attention turned to another significant and parallel shift within the discipline occurring at this time. In the latter 1940s reference to the “lighting designer” rather than the illuminating engineer began to appear occasionally in both industry and popular media, with the distinction between the two approaches largely self-defined by those claiming allegiance with design rather than engineering. One reason for the new nomenclature and professional identity (designer verses engineer) was the increasing prominence of lighting specialists entering the discipline from theatre or architectural practice, rather than from electrical engineering. During the later nineteenth-century and throughout the first third of the twentieth century the nation's most influential illumination specialists, such as Luther Stieringer, Henry Rustin, Walter D'Arcy Ryan, Adolph Dickerson, and D. W. Atwater came from electric engineering backgrounds and worked for the industry—most often General Electric, as discussed in Chapter 1.<sup>623</sup> Towards the later 1930s and early 1940s however, a number of individuals entered lighting design from alternative pathways.<sup>624</sup> This new generation of lighting specialists typically worked independently of the big corporate research divisions, establishing private practices

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<sup>623</sup> See Chapter 1, “Narratives of Progress,” 25-68.

<sup>624</sup> Both Stieringer and Rustin worked for Edison throughout their careers; Ryan was director of General Electric's Illuminating Engineering Laboratory from 1908 until the early 1930s; Adolph Dickerson worked for General Electric throughout his career; D. W. Atwater however, was employed by Westinghouse and was an important figure in the development and popularizing of colored architectural lighting. See “Lighting Designers—Selected Biographies,” in Neumann and Champa, 229-231.



and serving as consultants. The most successful lighting designers to emerge from the postwar period—such as Richard Kelly, Abe Feder, William Richardson, and Leslie Wheel—all operated private lighting consultancies. While it would take nearly three decades to achieve, the International Association of Lighting Designers (IALD), the first professional organization of lighting designers, rather than illuminating engineers, was established in 1969 with the aim of dedicating its efforts “solely to the concerns of independent, professional lighting designers” as will be explored more fully in this chapter.<sup>625</sup>

### **Stanley McCandless: Bridging Theater and Architecture**

One of the first lighting specialists to declare himself a lighting designer and to define this as a unique discipline with principles and practices different from that of illuminating engineering was the American lighting designer, architect, and associate professor of theater lighting design at Yale University, Stanley McCandless. In a 1946 interview for *The Christian Science Monitor*, staff writer Helen Henley asked McCandless about the evolution of his career and the path he had taken from an architecture student to lighting specialist.<sup>626</sup> As Henley reported, after completing a Master of Architecture at Harvard in 1923, McCandless spent a year abroad on a fellowship, returning to the United States and joining McKim, Mead, and White for a short period. He left architectural practice following an invitation from Harvard’s esteemed dramatist, Professor George P. Baker to develop and teach a new course in lighting and lighting philosophy as a part of his renowned program,

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<sup>625</sup> Historical information on the establishment of the IALD is scant, but the founding aims of the society are stated on the IALD website: <http://www.iald.org/about/About.asp>

<sup>626</sup> Helen Henley, “Good Home Lighting Part of Basic Plan, Not Afterthought, Says Expert,” *The Christian Science Monitor*, January 3, 1946, 12. Other studies addressing the formative role of theatrical lighting and theories of new stagecraft on the development of modern lighting design and architecture include: Sandy Isenstadt, “Eero Saarinen’s Theater of Form,” in *Eero Saarinen: Shaping the Future* (New Haven: Yale University Press, 2006), 99-115; and Dietrich Neumann, “Theater, Lights, and Architecture: The Career of Richard Kelly,” in *The Structure of Light: Richard Kelly and the Illumination of Modern Architecture* (New Haven: Yale University Press, 2010), 11-42.

Workshop 47, which Sheldon Cheney had also been involved with 15 years earlier.<sup>627</sup> At this point, as Henley recounted, “architect friends began turning to him for a consulting service. Eventually this led him into consultation work.”<sup>628</sup> In these years McCandless developed a personal methodology for designing light, which he applied to the stage and adapted to architecture.<sup>629</sup> Sharing his approach to lighting design with Henley, McCandless argued for the deep relevance of theater stagecraft theories and practices in advancing lighting design, proposing:

Light is a plastic medium. It fills space, even though we don't think of it that way—and we should so design it. The theater is the most amazing testing ground we have. Not that we would want some of its bizarre or flamboyant effects in our homes—but stage lighting is approached completely from the standpoint of achieving the desired effect.<sup>630</sup>

Clearly translating established traditions associated with the modern theater and new stagecraft ideals, McCandless demonstrated the universality of these principles and the usefulness of such a methodology when designing light for architecture, as explored in Chapter 2.<sup>631</sup> While the history of illuminating engineering could not be written without reference to the developments of theatrical lighting and the numerous cross-fertilizations between the two disciplines, prior to the mid-1940s in the United States the theater was not generally considered a primary training ground for architectural lighting specialists. For example, Bassett Jones devoted considerable attention to developing new methods for stage

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<sup>627</sup> See George Pierce Baker, “The 47 Workshop,” *Quarterly Journal of Speech* 5.3 (1919): 185-195; and for contemporary scholarship on Baker see, Dorothy Chansky, “The 47 Workshop and the 48 States: George Pierce Baker and the American Theater Audience,” *Theater History Studies* 18 (1998): 135.

<sup>628</sup> Henley, 12.

<sup>629</sup> McCandless published extensively during his professional career on techniques and theories of lighting for both the stage and architecture. See for example, Stanley McCandless, *A Syllabus of the Course in Stage Lighting* (New Haven: Whitlock’s Book Store, Inc., 1927); *Glossary of Stage Lighting Outline* (New York: Theatre Arts, Inc., 1926); *A Course in Lighting for Architects* (a paper presented before the twenty-fourth annual convention of the Illuminating Engineering Society, Richmond, Va., October 7-10, 1930); *A Method of Lighting the Stage* (Theatre Arts Books, 1932); “Merchandising with Light,” *Architectural Record* vol. 96 (Nov., 1944): 104-106; “Characteristics of Downlighting,” *Architectural Record* vol. 109 (Feb., 1951): 142, 145, 160.

<sup>630</sup> Henley, 12.

<sup>631</sup> On the relationship between the development of theories and methods of modern lighting for stage and interiors, see Chapter 2, “Invisible Mechanisms of Modernism,” 92-107.

lighting, yet he carefully bracketed his reasons for pursuing this area of research as a personal interest or hobby, suggesting:

My work in this field, such as it is, has been strictly for my own amusement. It has been the satisfaction of a hobby—as other men play gold, collect antiques, or paint pictures. I might add that my engagement in the practice of illuminating engineering is also an appendage to what, from my personal viewpoint, is the mother profession of electrical engineering. My strictly and purposely limited professional connection with the stage arose through an accident and probably shall remain so limited.<sup>632</sup>

Although Jones was attempting to make clear to readers that he did not consider himself an expert in theatrical lighting, the implication of his statement was that these were two very different areas of expertise, ultimately residing within the “mother profession” of electrical engineering. Whereas by the mid-1940s, McCandless repeatedly referred to stage lighting and its relevance to architectural lighting, suggesting that the lighting designer could easily move between these two realms, with the benefit of applying valuable lessons learned on the stage to non-theatrical environments. In addition to advocating for more direct exchange between architectural and theatrical lighting practitioners, he prioritized design as a disciplinary method for planning the lit environment.

Writing in 1948 for the progressive west coast architectural journal *Arts & Architecture*, McCandless proposed that as a designer, he possessed aptitudes and utilized methods and practices foreign to the engineer, contending that these were two very different disciplines. Defining the particular skill set required of lighting designers, he suggested they needed, “A developing sense of the functions and characteristics of light—artificial light—esthetically and physically, and a broadening acquaintance with technical means available today for using it,” claiming that this was as important to the lighting designer “as the

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<sup>632</sup> Bassett Jones, Jr. “The Possibilities of Stage Lighting Together an Account of Several Recent Productions,” *Transactions of the Illuminating Engineering Society*, vol. 11, no. 5 (1916): 547-572, quote on 548.

knowledge necessary to use any structural or decorative material.”<sup>633</sup> Then he described the scope of illuminating engineering, writing, “The manufacture and development of equipment for the control of light is an engineering problem, but the determination of its use lies entirely within the province of the designer.”<sup>634</sup> Careful to articulate the discrete territories of the lighting designer and engineer, McCandless was most adamant in his defense of the rightful place of the designer in the planning of light. He contended,

The complicated technical aspects demand an evolutionary development which implies a sympathetic partnership between the engineer and designer, but lighting is first a problem of design. It is the most blatant form of wishful thinking to expect the engineer—even the average illuminating engineer—to be a first rate designer.”<sup>635</sup>

### **The Influence of Design Discourse and Practice in the 1940s**

McCandless’ confidence in the hierarchical importance of the designer, above and beyond that of the engineer, in determining the use, and therefore the effects of light, must be seen within the context of the growing recognition and importance of design in the United States from the late 1930s onwards. While the discourse and disciplinary methods of design were adopted earlier and more readily in such fields as industrial and interior design, as discussed in Chapter 2, it was not until the mid to late 1940s that such a design focus began to be applied and promoted by those responsible for the planning of light. In this period, design education in the United States was being transformed under the influence of European designers, many of whom had fled during the war and settled in the United States taking up roles at American art schools, colleges, and universities. Design educators like László Moholy-Nagy, György Képes, Marcel Breuer, Walter Gropius, Joseph and Anni Albers, and others taught and promoted modern European design principles in American education

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<sup>633</sup> Stanley McCandless, “Lighting,” *Arts & Architecture* (May, 1948): 35-37.

<sup>634</sup> *Ibid.*, 35-36.

<sup>635</sup> *Ibid.*, 36.

programs.<sup>636</sup> Although McCandless was well into his professional career before the European diaspora had made an impact on American design education, it is likely that he would have had exposure to some of these notions at Yale, and moreover, as someone closely involved with New York's modern theater arts community where theories and practices influenced by the European avant-garde had been pursued since the early teens. Additionally, popular texts like Képes' 1944 *Language of Vision* made European design theories and principles accessible to a broad readership in the U.S during this period.<sup>637</sup> McCandless, describing the principal objectives of a lighting designer's work in *Arts & Architecture* employed both terms and concepts suggestive of a fair understanding of the principles of modern design:

Probably the designer's major effort consists of the selection and arrangement of visual elements in a definite composition. Design for the uncontrolled conditions of natural illumination has been the standard for so long that it is difficult to grasp the scope of the extended opportunities, when the brightness, color and distribution of the visual medium, light, can be selected and arranged in conjunction with the more familiar elements of design... With artificial light it is possible to reveal objects, details, or colors in proportion to their importance in the composition.<sup>638</sup>

McCandless' emphasis on the compositional ordering and imaging of discrete elements through the design of light, shadow, color, texture and pattern has much in common with Képes' theory of "optical communication." In *Language of Vision*, published just four years before McCandless' *Arts & Architecture* article, Képes proposed,

To perceive a visual image implies the beholder's participation in a process of organization. The experience of an image is thus a creative act of integration. Its essential characteristic is that by plastic power an experience is formed into an organic whole.<sup>639</sup>

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<sup>636</sup> See for example, Alan Findeli, "Moholy-Nagy's Design Pedagogy in Chicago," *Design Issues*, vol. 7, no. 1 (Fall 1990): 4-19. See also, Jeffrey Meikle, "American Design History: A Bibliography of Sources and Interpretations," *American Studies International*, vol.23, no.1 (April 1985): 3-40.

<sup>637</sup> Roy Behrens, "Art, Design and Gestalt Theory," *Leonardo*, vol. 31, no. 4 (1998): 299-303.

<sup>638</sup> McCandless, "Lighting," 36-37.

<sup>639</sup> György Képes, *Language of Vision* (Chicago: Theobald, 1944), 13-14; Képes defined "plastic" as the demonstration of "the formative quality, the shaping of sensory impressions into unified, organic wholes." Quoted text on pp., 15.

He held that such visual strategies were increasingly important in the modern world, providing hierarchical structures to combat the “chaos of our formless world.”<sup>640</sup>

Acknowledging the importance of vision in guiding and determining the human experience of the physical world, Képes addressed optical elements and effects as fundamental design considerations. He maintained that, “Vision is primarily a device of orientation; a means to measure and organize spatial events. The mastery of nature is intimately connected with the mastery of space; this is visual orientation.”<sup>641</sup> Similarly McCandless proposed:

The designer has a great responsibility that few realize today. Primarily light gives visibility...by designing lighting we can provide seeing conditions with even a greater element of comfort than that given by the uncontrolled conditions of natural light. Natural light discloses all things with unselective equality.<sup>642</sup>

The lighting designer then was afforded mastery of nature by providing visual conditions superior to those afforded by day light, conditions that would determine visual orientation and spatial perception. Artificial light, according to McCandless, offered the means through which the designer could organize and control the conditions of seeing, and thereby determine the visual experience of the environment.

Addressing the compositional aspects of the design of artificial light, McCandless shared a similar approach with Képes, yet he went beyond this gestalt informed discourse when broaching the role of atmosphere or “mood quality” in the visual composition of space.

Drawing once again on theories more closely aligned with those of modern stagecraft, McCandless suggested,

Many a good design has been brought to completion only to find that it gives the wrong effect. It lies deeper than the abstract motive of composition. It has something to do with a feeling, something akin to the thing we find or expect to find in the theater.<sup>643</sup>

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<sup>640</sup> Ibid., 15.

<sup>641</sup> Ibid., 13.

<sup>642</sup> McCandless, “Lighting,” 36-37.

<sup>643</sup> McCandless, “Lighting,” 37.

That “something” McCandless identified as critical to the success of any given lighting solution was the overall emotive or psychological effect of the total composition. Raising a similar concern to that Bassett Jones had identified earlier in the century with his plea for a consideration of the aesthetic qualities of a design, McCandless called upon the theater as a frame of reference, writing, “Here it has been long known that after a careful selection of the style and color of the scenery, costumes and properties, the lighting in the final analysis must contribute the mood quality to the stage picture.”<sup>644</sup> Bringing it back to non-theatrical lighting design, he inquired, “After all, is this very far removed from the problem of creating the impression on an individual as soon as he enters a room, or sees an object which has been designed to cause a definite reaction?”<sup>645</sup>

From the late 1930s through to the mid-1950s, the creation and manipulation of mood or atmosphere was frequently assigned to or associated with electric lighting applications in popular domestic advice literature. In this period electric light was marketed to consumers as a modern visual enhancer, able to be easily adjusted to create a variety of emotive or psychological conditions.<sup>646</sup> *House & Garden*, for example, advised readers in 1937 that whether one desired, “Gaiety or romance, action or relaxation—joy or meditation,” each and every effect could be achieved simply with “the flick of a switch.”<sup>647</sup> The magazine went so far as to promise that, “After dark your mood can be controlled by illumination.” This discourse though did not originate with lighting industry marketers or home advice columnists alone. It owes much to the shared language, both visual and theoretical, with modern theater lighting and stagecraft, as McCandless suggested, where such theatrical

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<sup>644</sup> Jones, “The relation of Architectural Principles,” 10-14.

<sup>645</sup> McCandless, “Lighting,” 37; on the marketing of electric light in regards to visual enhancement, see Chapters 2 and 3 of this study, 117-123; 148-154; and 185-194 in particular.

<sup>646</sup> However, as Neumann argues, the leveraging of “mood” as a means of selling electric lighting applications to the public was not a part of the postwar discourse on modern architecture. Neumann writes, “[McCandless’] recurring emphasis on the creation of ‘mood’ could come only from someone not trained as an architect in the modernist tradition.” Neumann, “Theater, Lights, and Architecture,” 16.

<sup>647</sup> “Introducing Conditioned Lighting,” *House & Garden*, no. 3 (Sept. 1937): 62-63.

strategies and effects had been utilized to craft mood as a part of the dramatic production for some time. Such effect-driven approaches to illumination planning became an increasingly important aspect of lighting design as a specialization, leaving efficiency, brightness ratio calculations and other more empirical methods and aims to engineering.

### **Richard Kelly: Lighting and the Rhetoric of “Good Living”**

Richard Kelly, arguably the best recognized American lighting designer of the mid-twentieth century, came to prominence roughly a decade later, and in the first fifteen years of his career, his work and writing focused on many of the same aspects as those identified earlier by McCandless.<sup>648</sup> Born in the Midwest, Kelly had moved to New York City in the late 1920s, enrolling at Columbia University and graduating in 1932. His limited experience in theater (in high school and university) and ad-hoc work with interior decorators in the 1930s, placed him at a disadvantage compared with McCandless’s sustained professional networks and collaborations within theater and architecture.<sup>649</sup> Perhaps because of this situation, Kelly found it difficult to obtain work as a lighting consultant in New York City in the 1930s. Justifying his struggle, he later recalled: “There weren’t lighting consultants then. Nobody would pay for my ideas, but they would buy fixtures, so I designed lighting and I designed lighting fixtures which I made and sold.”<sup>650</sup> Kelly’s memory of the professional climate for

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<sup>648</sup> The most comprehensive study of Richard Kelly to be published to date is Dietrich Neumann, ed., *The Structure of Light: Richard Kelly and the Illumination of Modern Architecture*, (New Haven: Yale University Press, 2010); see also Margaret Maile Petty, “Illuminating the Glass Box: Architectural lighting design and the performance of modern architecture in post-war America” *Journal of the Society of Architectural Historians* v.66, n.2 (2007 June): 194-21; and Maile Petty, “Edge of Danger.”

<sup>649</sup> Neumann addresses Kelly’s early career and involvement in theater in “Theater, Lights, and Architecture” in *The Structure of Light*, 12-25.

<sup>650</sup> While still enrolled at Columbia University in the late 1920s, Kelly began working for a number of New York interior decorators and lamp manufacturers, contributing to a variety of small residential projects and renovations. From 1929-1933 Kelly worked for the New York interior decorator Ruth Collins Allen, and throughout the later 1930s and early to mid-1940s he designed the lighting for a number of high-end residences including the Nelson Rockefeller House in Seal Harbor, Maine, by architect Wallace Harrison (1942), the apartment of Edgar J. Kaufmann, Jr., the Director the Museum of Modern Art’s Department of Industrial Design, located in the famous Campanile building at 450 East 52<sup>nd</sup> Street, New York City (renovated in 1945 by Kaufmann), and the 78 East 56<sup>th</sup> Street, New York City apartment of celebrity milliner Lilly Daché (1946). Quoted in Kelly, “Lighting Starts with Daylight,” 83.



lighting design in this period of course is not entirely objective and as McCandless and others had demonstrated there was an existing and growing appetite for lighting design, particularly among those that had the money to afford such a luxury at this time. While individuals like McCandless, and those associated with the more established practice of illuminating engineering, were finding work as lighting specialists in this period, lighting designers without formal training in electrical engineering, architecture, or theater stagecraft were not common prior to World War II. It was not a discipline with educational pathways or professional associations.

In later years Kelly would often invoke his degree in architecture as his primary professional pedigree, in fact his education and training as a designer began many years before he entered architecture school.<sup>651</sup> Completing a number of high-profile and primarily modernist residential projects by the end of the 1940s Kelly had developed a distinctive approach to interior lighting design and actively promoted his ideas and techniques in a number of popular publications such as *House & Garden*, *Interior Design and Decoration*, the *New York Times*, and *Flair*.<sup>652</sup>

The later 1930s and early 1940s was a period of rapid development of both electric lighting technologies and applications, particularly for the residential environment, as examined in Chapters 2 and 3.<sup>653</sup> Kelly astutely recognized the growing popular appetite and market for electric light in the home and positioned himself as an authority on the integration

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<sup>651</sup> Richard Kelly, "Biographical Outline." Dated November 1965. Not indexed at the time of reference, Kelly Papers, Sterling Memorial Library, Manuscripts and Archives collection, Yale University. Historical information regarding Kelly's collaborations included in this chapter were largely drawn from research conducted prior to the acquisition of the Kelly Papers by the Sterling Memorial Library, therefore index numbers are not included for references dating to this period.

<sup>652</sup> Betty Kelly, *Richard Kelly: A Bibliography* (Charlottesville, VA: American Associations of Architectural Bibliographers, 1961).

<sup>653</sup> See for example "Conditioned Lighting" *House & Garden* no. 3 (September, 1937): 62-63, 74; and the discussion of new uses of cove lighting in "Contemporary Home Replaces Expensive Victorian Mansion," *New Pencil Points* vol. 24, no. 10 (October, 1943): 35-45; and "Lighting Chapters in Books on Decoration," *Illuminating Engineering* no. 6 (June, 1947): 604-05. See also Chapters 2 and 3 of this study, especially 83-87 and 135-155.

of electric lighting into daily life.<sup>654</sup> Kelly's start in residential interiors, particularly in commissions for clients who were tastemakers or figures closely associated with the arts and New York City's cultural elite provided him with both the connections and authority he previously lacked. Equally, these clients also had the financial resources necessary to support Kelly's experimental approach to lighting design.

Unable to serve in the military during World War II owing to a medical condition, and finding it increasingly difficult to secure paid work, Kelly made a critical pivot, enrolling in the architecture program within the Bachelor of Arts at Yale University in 1942. Kelly would later claim his decision to pursue a degree in architecture was so that he might be better able to counter resistance to his design proposals within the architectural community, echoing similar complaints commonly raised within the illuminating engineering community since the first decade of the century. As he described in an interview for the *Saturday Evening Post*:

When I landed a sizable contract and suggested such things as the use of reflected light instead of glaring overhead fixtures, or varying light intensity according to the hour of the day I got nowhere. The really ambitious ideas seemed to founder in architects' offices. They were impractical, I was told, "for architectural reasons."<sup>655</sup>

While Kelly never acknowledged any awareness of the longstanding feud between lighting engineers and architects, certainly his first-hand experience of the acute disadvantage of this schism motivated him to seek architectural training.<sup>656</sup>

Following his study at Yale, Kelly reentered the profession casting himself as an independent architectural lighting consultant. In this period, he set about promoting his ideas about designing with light, publishing over twenty articles between 1946 and 1960. Kelly's earliest writings largely focused on advice regarding modern residential lighting

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<sup>654</sup> In the mid-1940s popular "home decoration" manuals began including new or expanded chapters on or discussions of residential lighting strategies, as examined in Chapter 3, "Gendered Discourses and Practices," 155-179.

<sup>655</sup> As quoted in Arnold Nicholson, "Mr. Kelly's Magic Lights," *The Saturday Evening Post* v.231, n.1 (5 July 1958): 61, 65, quote on 61.

<sup>656</sup> *Ibid.*, See also Der Scutt, "Richard Kelly, 1910-1977, A Personal Memento," *Lighting Design and Application* (Oct.1979): 56-58.

applications—hardly surprising given such work comprised the bulk of his early career and the incredible focus on the home in the United States during the immediate postwar period. Adopting a narrative style common among decorating columns, advice manuals, and shelter magazines of the period, Kelly employed popular language and familiar terms to describe modern lighting concepts and applications, picking up on similar themes utilized throughout the lighting industry’s marketing efforts, as explored in Chapter 3.<sup>657</sup> Much in keeping with the rhetoric of Light Conditioning, Kelly promoted the role of well-planned electric lighting in making the home “pleasanter, prettier, and more comfortable,” and other quality of life improvements—which included everything from tastier meals, to being able to read in bed without waking up one’s partner, and to medicine cabinets that would prevent “fatal mistakes”—all made possible through better lighting.<sup>658</sup>

Writing for *House & Garden* in December of 1946, Kelly described how tailored, task-appropriate lighting would not only make “seeing” easier but also would create the conditions of “good living.”<sup>659</sup> The article featured the lighting scheme for the apartment of Lilly Daché, which Kelly had recently completed. Describing the various lighting applications he had created for the apartment, he set out his theories on functional lighting for “dramatic and aesthetic effects.”<sup>660</sup> Invoking lifestyle rhetoric from the period, he urged readers to modernize electric lighting throughout the home in order to improve their way of life, arguing:

Today, good lighting is a vital part of good living. It begins, not with the house, but with all the things that make up your life in the house—reading, writing,

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<sup>657</sup> Kelly’s advice on residential lighting picks up on both the themes and language of other domestic advice authorities from the period, as discussed in Chapter 3, “Gendered Discourses and Practices,” 176-180 and 185-194.

<sup>658</sup> Richard Kelly, “The Better to See,” *House & Garden* v.90 (December 1946): 152-154, 191.

<sup>659</sup> *Ibid.*, 152.

<sup>660</sup> *Ibid.* In the contributor biographies of this issue, which appear with the front matter, *House & Garden* claims: “during a short but energetic career [Kelly has] been editor, architect and writer. He is known as a man who can do anything with lights.”

sewing; dining, playing bridge or Ping-Pong; finding a dress or a suit in the closet; giving a party where everybody feels wonderful, looks wonderful.<sup>661</sup>

Reiterating many of the associations characteristic of contemporary lighting industry marketing, Kelly's popular publications in this period can be seen as an extension of such commercially motivated rhetoric that connected the use of modern lighting technologies and techniques with a well-appointed residence, and that would have an impact not just on the look of the interior, but on the performance of these spaces and the experience of wellbeing within them. However, buried within this familiar material, was a hint of Kelly's own voice, which he would more fully articulate in the early 1950s. Particularly in his advice that the residential lighting plan should grow "with the plans of the house, right from the blueprint stage," Kelly situated light planning within the architectural design process and in relation to the specific needs of the inhabitants.<sup>662</sup> In so doing Kelly hinted at a more interesting proposition—one wherein the lighting designer served as a mediator between the static architectural form and the dynamic demands of human use.

Writing for the *New York Times* in 1948, Kelly again outlined a variety of lighting solutions for the home.<sup>663</sup> However, in this article he organized his advice around three principle characteristics of light, which he identified as: attraction, comfort, and personality. Kelly defined "attraction" as the use of light for "direction of interest," while "comfort" included more utilitarian applications of light for activities like reading, cooking, and dressing, and lastly "personality," he associated with atmosphere and mood. Aligning his advice with the interests and concerns of the contemporary home decoration audience, Kelly offered an alternative, tailored variation of McCandless' writing on this topic. In the *Arts & Architecture* article on lighting published five months earlier, McCandless had described the

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<sup>661</sup> Ibid., 152.

<sup>662</sup> Ibid.

<sup>663</sup> Richard Kelly, "Making the Most of Lighting," *The New York Times*, October 3, 1948: XX21.

four functions of lighting as visibility, comfort, composition, and atmosphere, arguing that these aspects formed the “basis of all visual design.”<sup>664</sup> Comparing these terms with those proposed by Kelly shortly thereafter in the *New York Times* article, important similarities and differences can be identified.

Kelly described what sounded very much like three of McCandless’s basic principles of lighting, but naming two with terms more common within interior decoration advice literature and women’s magazines. Both McCandless and Kelly stressed the importance of visual “comfort,” a factor that had been a focus of illuminating engineering since its inception and which was widely accepted as fundamental for any successful lighting scheme. Yet when broaching more designerly considerations, McCandless and Kelly differed. Instead of McCandless’ “composition” Kelly employed “attraction,” a readily comprehensible term to describe the more complex process of visual ordering of interior elements with different levels and types of illumination. In much the same vein, instead of atmosphere, Kelly used personality, a popular concept in discourse on women’s etiquette and home decoration, as examined in Chapter 3, to describe the use of light to create specific atmospheric conditions. While McCandless argued that atmosphere was much like the “stage picture,” in that an individual entering a room should immediately sense a particular “impression” which “has been designed to cause a definitive reaction,” Kelly proposed that a guest, on entering the living room “should sense the personality of his hostess.”<sup>665</sup> Thus McCandless offered a generic scenario open to a variety of potential “reactions,” while Kelly associated the effects of this type of lighting much more closely with specific connotations tied to the gendered discourse on personality.

Finally, while both Kelly and McCandless utilized the term “comfort” to identify the role of electric lighting in providing pleasing visual conditions for a variety of human

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<sup>664</sup> McCandless, “Lighting,” 33.

<sup>665</sup> McCandless, “Lighting,” 34; and Kelly, “Making the Most of Lighting.”

activities, how each designer described this concept further reveals the fundamental differences between their approaches. Discussing research on the “pathological aspect” of vision, McCandless argued for the importance of managing glare in order to provide conditions for “comfort in seeing”—very much in keeping with illuminating engineering practice.<sup>666</sup> Alternatively, Kelly described the principle of comfort more abstractly, employing a variety of examples taken from daily life, rather than a concrete definition.<sup>667</sup> Rather than presenting the science of visual acuity and glare, Kelly argued for the value of comfortable visual conditions in the experience of the domestic environment and daily life.

While widely published in the 1940s, Kelly largely mimicked or adapted industry rhetoric, regarding the use of electric light in residential interiors, offering little by way of new approaches. From the early 1950s forward, however he increasingly discussed lighting in relation to architectural conditions and practice, steadily abandoning his focus on lifestyle and domestic décor. This shift was accompanied by his growing involvement with modern architecture through a number of high profile corporate and private commissions with some of the most prominent modern architects practicing in the United States at the time.<sup>668</sup> Kelly’s transition from consumer-focused lighting to large-scale corporate projects was not unique, and was instead, indicative of a larger shift within both architectural practice and lighting design. From the mid-1950s onwards, it would seem lighting design, and architectural lighting design in particular, turned a corner with architects and lighting designers working more closely together throughout the design process. While it would be nice to think this shift

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<sup>666</sup> McCandless, “Lighting,” 33.

<sup>667</sup> He described that “comfort” as the “part lighting plays in filling our day-to-day needs,” such as “reading, sewing, listening to music, receiving friends, dining, cooking, [and] dressing.” Kelly, “Making the Most of Lighting.”

<sup>668</sup> Regarding the shift of approach in his writing see for example, Richard Kelly, “Design Journal: Richard Kelly, Lighting Design Consultant Notes Some Problems Involving Public Lighting,” *Interior Design and Decoration* (June 1949): 42-47; Richard Kelly, “Focus on Light,” *Flair* (Feb. 1950): 15, 66-69; Richard Kelly, “New Light on Living,” unpublished lecture (dated 25 July 1955), Kelly Papers, Sterling Memorial Library Special Collections, Yale. On Kelly’s collaborations with prominent modernist architects in the 1950s see Margaret Maile Petty, “Corporate America and the New Luminous Environment: Kelly’s work with Johnson, Mies, and Noyes,” in *The Structure of Light*, 63-80.

was due to newfound enlightenment on the part of both it is much easier to believe that in this period the demands of modern architecture, both aesthetic and technical, could no longer be met without the involvement of a number of specialists—from vertical circulation, to air conditioning to lighting, big buildings from the 1950s demanded the cooperation of a diverse design and technical team.<sup>669</sup>

### **Lighting as an Integral Part of Architecture**

For all the reasons discussed above, the 1950s was an important decade for the advancement of lighting design. Whether Kelly recognized this at the time or he was merely fortunate with the serendipitous timing of the publication of an article in 1952, for which he would be known throughout the remainder of his career and until the present day—“Light as an Integral Part of Architecture.” This article, when read in relation to Kelly’s publications from the later 1940s represents quite a departure from his focus on residential lighting and lifestyle rhetoric. Rather than offering colorful advice for homemakers, here Kelly addressed a much broader context, proposing a simple, flexible framework for planning light in relation to the visual environment.

Despite the focus on architecture in the title of the paper, the methodology he set out in it was much more closely aligned to theories being advanced by designers like Képes, who were primarily interested in visual perception and spatial planning. Very much in the tradition of Bassett Jones’ 1908 paper, Kelly offered an aesthetic framework for light, one that took the human eye and visual perception as its primary subject, rather than architecture, much as Steinmetz had proposed in 1916.<sup>670</sup> An eclectic manifesto, Kelly’s paper brought together half a century of thinking and writing about light, synthesizing approaches and

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<sup>669</sup> On the history of the development and impact of modern architectural technologies, see Reyner Banham, *Architecture of the Well-tempered Environment* (University of Chicago Press, 1984).

<sup>670</sup> Jones, “The relation of Architectural Principles to Illuminating Engineering Practice”; and Steinmetz, “The Scope of Illuminating Engineering.”

perspectives resonant with the discourse and debates of the I.E.S., theories of lighting for the stage, modern approaches to spatial design and visual ordering, and aspects of modern architectural discourse. Examining the key assertions of the paper, it is possible to identify these synergies and the continuity of much of his assertions within this broader history. The paper begins:

A feeling for light and lighting starts with visual imagination, just as a painter's talent does. Think of the creation of a watercolor rendering—First, major highlights are imagined—then, grades washes of different luminosity are added and—then, the detail of minor lightplay makes the idea clear and entertains the eye.<sup>671</sup>

Continuing on this tack, Kelly kept emphasis on the eye and the role of light in directing human perception, writing:

In front of the mind's eye are three elements in the perceptions of visual design—three elemental kinds of light effect which can be related to the art of painting for easier visualization: (1) Focal glow or highlight. (2) Ambient luminescence or grades washes. (3) Play of brilliants or sharp detail. These three elements are also the order of imaginative planning.<sup>672</sup>

From the outset then, rather than focusing on descriptions of the characteristics of light or other divisions of light typologies in relation to architectural or engineering practice, Kelly labored to give a sense of the way in which lighting appeared to the viewer, its effects, and how it behaved in terms of human perception. This emphasis becomes even more apparent in his evocative descriptions of the “three elemental kinds of light effects”, which called upon familiar and powerful imagery.

Focal glow, he first described in atmospheric terms, suggesting it was akin to “the follow spot on the modern stage...the pool of light at your favorite reading chair...the shaft of sunshine that warms the end of the valley...candlelight on the face...and a flashlight on

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<sup>671</sup> Kelly, “Lighting as an Integral Part of Architecture,” 24.

<sup>672</sup> *Ibid.*, 24.



the stair.” Then he offered an overview of how focal glow functioned in terms of ordering the visual environment and directing human responses or actions. He suggested,

Focal glow draws attention, pulls together diverse parts, sells merchandise, separates the important from the unimportant, helps people see. Focal glow sometimes becomes multiple foci desirably producing a significant composition of attention.<sup>673</sup>

Following the same structure, he introduced ambient luminescence, describing it as like that of the:

...uninterrupted light of a snowy morning in the open country...foglight at sea in a small boat...twilight haze on a wide river where shore and water and sky are indistinguishable...[an] art gallery with strip-lighted walls, translucent ceiling, and white floor.<sup>674</sup>

In keeping with the importance assigned to such a luminous condition as argued by Appia and Craig nearly a half century earlier, Kelly then identified the properties and effects of this “shadowless illumination” on the perception and experience of space.<sup>675</sup> Not so different from Appia’s definition of diffuse light, he proposed that ambient luminescence: “minimizes the importance of all things and people,” and that it suggests both “freedom of space” or “infinity,” and was “reassuring” and “restful”.<sup>676</sup>

For his final and most diverse typology of light, play of brilliants, Kelly called upon the greatest variety of images for his evocative description, including:

Times Square at night...[an] eighteenth century ballroom of crystal chandeliers and many candle flames...sunlight on a fountain or a rippling brook...the rose window of *Chartres*...night automobiles at a busy cloverleaf...a night city from the air...a sparkling cabinet of fine glassware.<sup>677</sup>

Finally, describing the human response to this dynamic type of light, Kelly proposed it “excites the optic nerves...stimulates the body and spirit, quickens the appetite, awakens

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<sup>673</sup> Kelly, “Lighting as an Integral Part of Architecture,” 25

<sup>674</sup> *Ibid.*, 25.

<sup>675</sup> On Appia and Craig, see Chapter 2, “Invisible Mechanisms of Modernism,” 92-100.

<sup>676</sup> Kelly, “Lighting as an Integral Part of Architecture,” 25.

<sup>677</sup> *Ibid.*, 25.

curiosity, sharpens the wit. It is distracting or entertaining.<sup>678</sup> In this and his other two categories of light, rather than making distinctions between modern and historic uses or types of light, Kelly conjured scenes in readers' minds of light in different times and at different scales—from a small boat at sea set in the fog to a bright white modern art gallery, and from an eighteenth-century ballroom to the view of a city at night seen from the window of an airplane. Describing atmospheres and uses of light for creating types of spaces and human experiences, Kelly offered an understanding of “lightplay” that was defined by effect and impact of any given type of light—whether flame, electric, or natural—on the human context and perspective of the viewer, rather than the source of the illumination.<sup>679</sup> Such a framework, while related to the discourse and theories of a number of disciplines as suggested above, was unlike much of the contemporary writing on either lighting design or modern architecture. Despite its unusual nature and remarkably personal voice, Kelly's article quickly became a point of reference for those working in lighting design and advocating for its role in the design of modern architecture, as best demonstrated in another remarkable publication, the 1958 special issue of *Progressive Architecture*, entitled “Lighting Is Architecture.”<sup>680</sup>

### **Architectural Lighting Design and 1950s American Corporate Architecture**

Guest edited by the architect and critic, Henry Wright, “Lighting Is Architecture” was a significant iteration within the historically protracted debate over the role of artificial light in

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<sup>678</sup> Ibid., 24-25.

<sup>679</sup> In the final section of the *Progressive Architecture* issue, “Lighting is Architecture,” there is a summary of a round table discussion amongst the authors who had contributed to the issue. In the course of critiquing their individual contributions, C.M. Culter asked Richard Kelly to explain his terms, “ambient luminescence”, “focal glow”, and “play of brilliants” because he argued, “it would be helpful to the architect and others to get the exact meaning of these terms,” in “Lighting Is Architecture,” *Progressive Architecture* v.39 (Sept. 1958), quote on 179.

<sup>680</sup> Henry Wright, “Lighting Is Architecture,” 115-123. Henry Wright Jr., son of Henry Wright, the town planner, well-known for his partnership with Clarence Stein, was editor of *Architectural Forum* in 1930s and 40s, and authored dozens of articles on architecture, lighting and engineering, with a particular (and early) interest in passive solar design.

architecture, bringing together such key issues as: the role of the architect in relation to that of the lighting specialist (illuminating engineer or lighting designer), the situation of light planning within the architectural design process, the architectural integration of lighting and lighting equipment, and the functional uses of light in relation to its use in the creation of luminous effects for both symbolic and decorative purposes. With essays contributed by prominent lighting designers such as Kelly and Abe Feder, known for his work in New York theatrical design and a number of high profile architectural projects, as well as engineers, including C.M. Culter from the Advanced Application Department of General Electric, and daylighting specialist Kenneth C. Welch, and edited by Wright, who was himself closely associated with the advancement of modern architecture in the USA, the collective expertise and perspectives in this issue was exceptional in terms of its balance and breadth—particularly for a professional architectural journal. While neither were new assertions in 1958, “Lighting Is Architecture” offered fresh interpretations of both the argument for the independence of lighting design and for the consideration of lighting as an integral aspect in the architectural design process. What is most valuable about this special issue then, is not the familiar arguments it presented to readers (however new they may have seemed to those who contributed to the issue), but rather the way which the architectural, lighting design, and engineering communities were engaging with these questions and how their collaborative efforts were impacting the design of modern architecture in the United States during this period.<sup>681</sup>

There were a number of factors contributing to such an atmosphere of collaboration in the postwar era, including, the increasing popularity of modernist architecture for prestigious corporate commissions, the development of more efficient, powerful, and complicated

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<sup>681</sup> On the adaptation, expression and symbolism of modern architecture in the United States during the postwar period see, William Jordy, *American Buildings and Their Architects: The Impact of European Modernism* (Garden City, NY, 1973); Vincent Scully, and Neil Levine, eds., *Modern Architecture and other Essays* (Princeton University Press, 2003); and Kathleen James-Chakraborty “Proportions and Politics: Marketing Mies and Mendelsohn,” *GHI Bulletin Supplement 2* (2005): 51-64.

lighting systems, and a buoyant United States economy that allowed for such luxuries as lighting consultants. Furthermore, technical advances in electric lighting and architectural technologies more generally, facilitated more advanced and integrated solutions to such challenges as: regulating the performance of the glass curtain wall—reducing glare and maintaining transparency by balancing light levels; delivering even light levels throughout deep plan interiors; providing new mechanisms for decorative or visual enhancement of architectural elements and materials; and more generally contributing to the imaging of corporate America as modern, technologically driven, and well-resourced.<sup>682</sup>

*Progressive Architecture's* announcement of a new field of architectural lighting was then, more of an update describing the contemporary relationship between the disciplines of architecture and lighting design, and is more usefully seen as an extension of the work and contributions of many lighting engineers, designers, architects, and theorists—as has been demonstrated in the preceding chapters—who advanced innovative and experimental approaches to lighting design from the later nineteenth century onward. From Stieringer's luminous sketches to D'Arcy Ryan's gentle floodlighting and luminous shadows at United States world's fairs; from Jones' calls for greater prioritization of the aesthetic sensibility to Sheldon Cheney's efforts to position electric light as the most important medium of modern design; and from General Electric's announcement of a new nocturnal architecture defined by flood-lit skyscrapers to McCandless and Kelly's work and writing promoting an independent discipline of lighting design—the history of the science and art of light in architecture had been as varied and broad as the terms set out for the discipline by the I.E.S in 1906. This history—as well as that of the development of modern architecture—seems to have gone unnoticed, or at the very least unreferenced, by Wright who opened “Lighting Is Architecture,” with the claim that electric lighting in “the space of a generation” had

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<sup>682</sup> On such aspects of postwar American architecture, see Friedman, *American Glamour*.

“revolutionized interior and even exterior [architectural] design.”<sup>683</sup> Despite such historical amnesia, Wright’s introduction to “Lighting Is Architecture” offers an important link between earlier theories and approaches regarding the planning of light in architecture and postwar American architectural discourse and practice. In his essay Wright situates the role of electric light within the aims of postwar modern architecture in the USA, giving special attention to “the tremendous freedom it has given to planning” and crediting the near elimination of “the distinction between ‘inside’ and ‘outside’ space” to the partnering of electric lighting and air-conditioning technologies.<sup>684</sup> Describing the three primary architectural innovations of electric light, Wright identified: liberation of the plan from the restrictions of daylighting; “complete control” over the atmosphere and “mood” of the interior; and the integration of electric lighting equipment with the structure and structural patterning of modern architecture.<sup>685</sup> Six projects were featured in the issue, each illustrating a particular aspect of architectural lighting in modern architecture, including: enrichment of materials, development of function, definition of structure, assertion of purpose, use of space, and definition of varied spaces. Four of the six case studies were large-scale corporate projects and all six conformed to the tenets of International Style modernism as Johnson and Barr had defined them in the early 1930s, as explored in Chapter 2.<sup>686</sup> Contextualizing these principles in relation to the architectural integration of light, Wright asserted such an approach “makes it possible (if not mandatory) to use light to emphasize or understate textures, to bring out the sheen of polished materials and surfaces, to highlight interesting

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<sup>683</sup> Wright, “Lighting Is Architecture,” 115.

<sup>684</sup> Ibid.

<sup>685</sup> Ibid.

<sup>686</sup> Henry-Russell Hitchcock and Philip Johnson, *The International Style: Architecture Since 1922* (New York: W.W. Norton & Co., 1932); See also discussion of the tenets of the International Style in relation to discourse on electric lighting, in Chapter 2, “Invisible Mechanisms of Modernism,” 108-117.

shapes, and even to alter the apparent proportion of entire rooms. In a word, more than ever, lighting *is* architecture.”<sup>687</sup>

In addition to his summarizing of the characteristics of architecture lighting in relation to modern architecture as it was being defined during this period in the USA, Wright also included the lighting designer’s point of view, calling upon Kelly’s framework from “Lighting as an Integral Part of Architecture,” paraphrasing the lighting designer’s definition of the “three broad terms for types of illumination” and describing this framework as the “jumping-off point for the solution of all lighting problems.”<sup>688</sup> Wright’s translation and validation of Kelly’s methodology is significant at this historical juncture; he connected a framework rhetorically out of character with contemporary architectural discourse, demonstrating both its relevance and benefit, and employing a number of well-illustrated case studies, the sum total of which provided a rationale for his assertion that “lighting is architecture.”

The 1958 special issue of *Progressive Architecture* also offers evidence of the recalibration of Kelly’s career in the mid-1950s, bridging his previous focus on residential interiors with his more recent engagement with large-scale corporate projects. The dramatic juxtaposition of these two areas of Kelly’s practice is illustrated when comparing two of the issue’s features: one, an article written by Kelly describing a variety of electric lighting applications and effects he had designed for his own New York City apartment; and second, the lighting program he developed for one of the most high-profile modern corporate commissions of the period—the Seagram Building.<sup>689</sup> Designed in collaboration with Mies

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<sup>687</sup> Ibid., 115, 117.

<sup>688</sup> Ibid., 117.

<sup>689</sup> Richard Kelly, “A Case Study: Apartment Lighting,” *Progressive Architecture* v.39 (September, 1958): 171-177.

van der Rohe and Philip Johnson, the lighting of the Seagram Building was featured as a case study, illustrating Wright's concept of architectural lighting as "definition of structure."<sup>690</sup>

### **Seagram's Tower of Light: the Structure of Ornament**

Opening the feature on "definition of structure" with a photo of the Seagram Building at night, radiating light from the interior and throwing the ornamental pattering of Mies' architectural bays into sharp relief, Wright called attention to the recent citation awarded to the building by the Committee of Architectural Awards for the Fifth Avenue Association, naming 375 Park Avenue as the best of the towers built on the prestigious avenue between 1956-57. One of the reasons given for the building being awarded this prize was its notable nighttime appearance. Wright quoted the award citation, which called attention to the contribution of the lighting to the overall (decorative) effect of Mies' architecture: "At night, the building glows with great distinction by means of skillful interior lighting design to achieve this effect."<sup>691</sup>

A prestige commission from its inception, when completed in 1958 the 38-story tall New York headquarters for the Seagram Corporation was the most expensive office tower built to that date in the USA, boasting an array of exotic and costly materials, customized fittings, and an extensive electric lighting program that both unified and enhanced these elements. Phyllis Lambert, a pivotal figure in the development of the project, advocated for the need to commission an important modernist architect for the design of the building, eventually securing Mies's appointment in 1954, as well as Johnson as associate architect and Kelly as lighting consultant.

Developing an integrated lighting scheme for the project that would harmonize the plaza, recessed lobby, and the full elevation of the glass tower, the design team called upon a

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<sup>690</sup> "Seagram Building: Definition of Structure," *Progressive Architecture* v.39 (September 1958): 139-143.

<sup>691</sup> *Ibid.*, 139.

host of engineers and other specialists creating a number of bespoke elements required to realize Mies' concept for the Seagram Building.<sup>692</sup> To achieve the effect Mies desired, Kelly argued "...that the ground floor had to be much brighter than the upper floors; otherwise, design effect would be lost."<sup>693</sup> Building on the lessons learned in their previous collaborations in Chicago on both 860-880 Lake Shore Drive and the Esplanade Apartments, for the plaza and ground floor Kelly created a soft pool of light on the plaza, surrounding and cushioning the recessed lobby, emphasizing the entrance with further downlights in the building's canopy. Another line of downlights on the inside of the frontal glass walls ensured their transparency at night. In the margins of a personal photograph of the Seagram Building illuminated at night, Kelly scribbled, "A tower of light, but the lobby predominates," casually observing what most critics overlooked in their fascination with the glowing tower above. Inside the lobby, Kelly employed a tailored wall-washing system to light the full height of the lobby's towering travertine-clad elevator banks, enhancing the drama both of the building's proportions and precious materials. As Wright described:

Uniform intensity of brightness over the lobby walls with fixtures minimized was the design goal to achieve simple monumentality effortlessly and elegantly. It required the courage to spend enough wattage to achieve the minimum intensity that could be expressive. It is probably the highest wattage per foot yet used in a lobby.<sup>694</sup>

Above, a luminous ceiling on each floor traced the perimeter of the building in a twenty-foot wide band, illuminating the office spaces inside and serving as an aesthetic mechanism for articulating the structure of the building after dark. While the ceiling was illuminated throughout the day—ostensibly to counterbalance the effects of glare inside—the full visual impact of the ceiling was most apparent after dusk when the interior illumination

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<sup>692</sup> On the design of the lighting for the Seagram Building and the relationship of this project to previous collaborations with Mies and Johnson, as well as the contributions of other specialists to this project, including Lightolier's Noel Florence and manufacturer Edison Price, see, Petty, "Illuminating the Glass Box."

<sup>693</sup> Quoted from "New Progress in Light," *Architectural Forum* n.106 (Feb. 1957): 152–155, quoted text on, 155.

<sup>694</sup> "Seagram Building: Definition of Structure," 140.



unified the full elevation of the façade—creating an effect which was dubbed in promotional materials as Seagram’s “Tower of Light”.<sup>695</sup> Kelly’s luminous ceiling also received complimentary attention in trade media. The *International Lighting Review* for example praised the “specially designed and engineered luminous ceiling system...which glows at night as well as during the day.”<sup>696</sup> The article also noted other aspects of the ceiling that married functional and decorative purposes, including the translucent vinyl diffuser panels set in an anodized aluminum-trimmed modular grid corresponding exactly with that of the exterior articulation of the facade. Wright similarly praised this luminous “definition of structure” for “boldly silhouette[ing]” the bays of the structural steel frame and the bronze mullions.<sup>697</sup> While Wright and others complimented the “structural” integration of Kelly’s luminous ceiling, arguably it was as much, or more aesthetically integrated with the decorative patterning of the building. The advantage of a luminous ceiling, which had been demonstrated by Appia as early as 1912, was that it masked the messy working elements of a building behind a unified, diffuse lit surface.<sup>698</sup> For the Seagram ceiling, the patterning of the façade was merely carried over on to the division of panels hiding the plenum cavity.

Kelly’s lighting scheme for the Seagram Building also addressed the persistent criticism that architects tended to design buildings for either their daytime or nighttime appearance, but rarely for both. Creating a dual lamped and circuited luminous ceiling system, Kelly’s system provided functioning illumination for the offices along the perimeter of the tower. At night the system was switched to the secondary circuit, which used warm white fluorescent lamps running at one-quarter maximum output to produce a soft effect with

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<sup>695</sup> Advertisement, “They Dreamed of a Tower of Light,” *New York Times* 7 Apr. 1957: Sec. 10, supplement, 15

<sup>696</sup> “Seagram Building, New York City,” *International Lighting Review* 12 (1961): 68–69.

<sup>697</sup> “Seagram Building: Definition of Structure,” 140; see also See Lambert’s comments on the luminous ceiling, Phyllis Lambert, *Mies in America* (New York: H.N. Abrams, 2001), 514, note 127.

<sup>698</sup> On Appia’s luminous ceiling for the *Festspielhaus* in relation to the development of such elements in modern American architecture see, Maile Petty, *Illuminating the Glass Box*, especially 205–209.

much lower light levels.<sup>699</sup> The illumination produced by the secondary system was designed to complement the custom bronze-tinted glass of the curtain wall and approximate the color of the incandescent lamps used in the building's lobby, providing continuity between the illuminated tower and lobby, and again enhancing the building's decorative program.<sup>700</sup>

Calling attention to the success of the ceiling in achieving such aesthetic aims Jürgen Joedicke, in his 1962 overview of the development of office design in the USA, described how:

The external effect of the lighting at night was deliberately utilized by the architects as an aesthetic feature, thus giving artificial light an entirely new significance as an element of architectural design. . . . [L]ighting by 'luminous ceilings' is provided on all floors which strikingly reveals the building's structural pattern at night.<sup>701</sup>

### **Integrating Light, Structure, and Image**

Shortly after the completion of the Seagram Building, and one month after the publication of "Lighting Is Architecture", the *New York Times* ran a short article entitled, "Lighting, once mere utility, has become an important element of design."<sup>702</sup> Although the article addressed the use of architectural lighting in popular terms, nearly all of the photographs illustrating the story were of prestigious large-scale corporate commissions, including the General Motors Technical Center, Seagram Building, Tishman Building, and Bankers Trust at Thirty-ninth Street. The article's author, Thomas Ennis, echoed Wright's assertions in *Progressive Architecture*, proclaiming:

One of the big advances in recent years in architecture is the use of lighting. From a subordinate position, often regarded merely as a utility, lighting is now an art that combines function and decoration. Nowhere is this more apparent than in new

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<sup>699</sup> On the lighting of the Seagram Building and its place in a series of collaborations investigating the design of light in modern American corporate architecture, see Maile Petty, "Corporate America and the New Luminous Environment," 70-72.

<sup>700</sup> Cialdella, *Richard Kelly, Selected Works*, 1993.

<sup>701</sup> Jürgen Joedicke, *Office Buildings* (New York: Frederick A. Praeger, 1962), 140-141, 158-159.

<sup>702</sup> Thomas Ennis, "Lighting, Once Mere Utility, Has Become an Important Element of Design," *New York Times* (26 October 1958): R1.

skyscrapers, stores and bank buildings, in which lighting is an integral design element.<sup>703</sup>

Offering a rationale for this seemingly rapid transformation of the role of light in architecture, Ennis reported that the “architectural aspects of lighting” were increasingly important to both architects and interior designers, because of “the control of lighting that modern equipment makes possible.”<sup>704</sup> Continuing, Ennis borrowed directly from Wright’s introduction to “Lighting Is Architecture” describing how “this control” permitted the use of light for a variety of aesthetic or decorative purposes, such as enhancing the “sheen of polished materials and surfaces,” highlighting “interesting shapes”, and altering “the apparent proportions of entire rooms.”<sup>705</sup> Such parroting of Wright’s assertions, which had a close connection to the methods outlined by Kelly in his 1952 article, in the popular media indicate something of the public interest in architectural lighting design in this period, and moreover the growing recognition of the importance of integrated light planning within architectural practice and the greater cooperation between architects, interior designers, and lighting specialists in the United States during the mid-1950s.

However, as suggested above, much of this popular media coverage focused on the large corporate architecture projects of the era, where architecturally integrated lighting design was typically most necessary and most dramatic in terms of the aesthetic articulation and imaging of the buildings and corporate campus. Frequently such articles included discussion and description of the lighting systems and dusk or nighttime photographs taken by the era’s established architectural photographers that privileged these luminous features. For example, in 1951 *Architectural Forum* published an article on the General Motors Technical Center, then still under construction, applauding the use of new materials and

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<sup>703</sup> Ibid.

<sup>704</sup> Ibid.

<sup>705</sup> Ibid.

techniques, and emphasizing Eero Saarinen's integrated approach to the design process, which the journal likened to that of industrial design, much as the Cheney's had argued for 15 years earlier. Further, the article suggested that Saarinen had achieved a particularly "industrial" expression of modernism by integrating "air conditioning and lighting with the classic pure shapes and expressive proportions of the structure."<sup>706</sup> Indicative of the growing attention to integrated architectural lighting practices, the 22-page article included a section on "The Ceiling", which was praised for the "endless number of lighting schemes" that could be produced by altering standardized ceiling panels within the system and the number of modern services it camouflaged: air conditioning, acoustical dampening, sprinklers, and modular partition sockets.<sup>707</sup> Also noted was the "projecting" of the Technical Center's modular grid onto the ceiling plane, as would also be done at Seagram.<sup>708</sup> The visualizing of modernism's modular grids through the integration of lighting systems became a hallmark of excellence in the design of such corporate environments in the midcentury. Moreover, such prestigious modern corporate campuses and towers, with their luminous ceilings and luxurious materials were seen as symbolic of the growing power and command of corporate America in the postwar period. As *Architectural Forum* summarized its discussion of the Technical Center,

The advance platoon of the automobile industry, its research engineers, could hardly be housed in a more suitable environment than this strong intent design. It is a place for clear thinking. But in addition to the refined design...and the high civilization of the physical environment...Saarinen and his associates have helped the leading producer in the automotive field build an exciting signpost, a plea to all industry, and a proper symbol for research toward tomorrow.<sup>709</sup>

Like that of the Seagram Building and many others that would follow this first wave of postwar corporate commissions, the lighting of the Technical Center, day and night,

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<sup>706</sup> "General Motors Technical Center," *Architectural Forum* v.95 (Nov. 1951): 111-123, quote on 113.

<sup>707</sup> *Ibid.*, 121.

<sup>708</sup> *Ibid.*, 121.

<sup>709</sup> *Ibid.*, 122.

contributed significantly to the imaging of General Motors as efficient, modern, and future-looking. As *Architectural Forum* suggested in 1956, such projects served not only as “a historic symbol of today’s industrial progress,” but as a promise of “tomorrow’s ambition.”<sup>710</sup>

#### Chapter 4: Conclusion

Such large-scale, well-resourced corporate commissions allowed Kelly, and others among the first generation of postwar lighting designers, a new level of agency and engagement with the development and articulation of modern architecture in the United States. Such projects offered lighting designers the opportunity to translate the symbolic and aesthetic aims of architects and their clients through integrated lighting systems that had as much or more to do with these objectives than with simply providing the utility of light, as Innes had claimed in 1958 in the *New York Times*. The effectiveness of these luminous environments in imaging corporate America in the postwar period was so successful that they became seen as synonymous with American corporate culture. The rhythmic patterns of efficient fluorescent lighting stretching towards the artificial horizon of corporate America’s deep plan interiors became a common visual trope in Hollywood’s critiques, as for example in Billy Wilder’s dark representation of the morally corrupt, suffocating environment of a large urban insurance office portrayed in the 1960 film, *The Apartment*.<sup>711</sup>

However, lighting design as a maturing discipline maintained and developed its relationships with the architectural community, responding to such changing attitudes and fashions within the climate and practices of architecture. In 1969, the discipline had grown in strength and numbers so as to support the founding of its first professional organization, the International Association of Lighting Designers (IALD). In many ways a belated response

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<sup>710</sup> “GM’s Industrial Versailles” *Architectural Forum* v.104 (May 1956): 122-129.

<sup>711</sup> See Margaret Maile Petty, “Perpetual Noon: Fluorescent Lighting and the Modern Office,” *Scapes* (Fall 2008): 9-15.

(twenty years later) to Higbie’s provocation concerning the maturity, autonomy, and ethical responsibility of lighting specialists, the IALD set out to ensure lighting design was recognized as a professional discipline, despite any accreditation or licensing, and that its members maintained the highest level of professional standards, which meant, in no uncertain terms, independence from commercial interest.<sup>712</sup> One of the biggest challenges that those engaged in illuminating engineering, or later lighting design, faced was the very breadth of the discipline as set out in the early years of the twentieth century. Much as the I.E.S. had set out to establish a vehicle for the promotion of a new discipline and for the dissemination of knowledge specific to the development of the field in the early part of the twentieth century, so too did the IALD aim to support professionalization, excellence and education for a new generation of lighting specialists.

Whether owing to the strict enforcement of the association’s code of ethics, the lack of formal educational pathways for the discipline, or limited demand for what some considered luxury specialists, a decade after its establishment the IALD could only claim 150 members.<sup>713</sup> While never posing a real threat to the I.E.S. in terms of membership numbers, the IALD was and remains an important organization for the lighting design community—defining it and its practices as distinct from that of engineering.

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<sup>712</sup> Indeed this remains a primary condition of membership in the IALD and is set forth explicitly in the association’s Code of Ethics and Professional Conduct. It is considered a “Conflict of Interest” for any IALD member to “...accept fees, commissions, or any other consideration of value from anyone attempting to compromise the IALD Member’s professional judgment or in return for specifying a particular lighting or lighting-related product for a specific project, except from clients or employers for whom services are being performed.” Article V. Obligations to the Client or Employer, Code of Ethics and Professional Conduct, IALD, <http://www.iald.org/about/principles/code-ethics.asp>

<sup>713</sup> Willard Warren, an IALD member and a prominent American lighting designer in this period, described the nascent character of the discipline in the later 1950s, suggesting that typically the principle electrical or mechanical engineer of the engineering firm assigned to any given project would be assigned with the specification of the lighting. Usually, Warren argued, these designs were “functional first, and decorative or interpretive a distant second.” Moreover most major engineering firms at that time, he recalled had “in-house lighting engineers, that way the client or architect did not have to pay twice—once to the engineering firm and then again to a separate lighting consultant.” Transcribed from an interview with the author, New York City, 12 February 2002.

In a feature on “The Lighting Designer” appearing in the *New York Times* in 1979, Susan Slesin reported on the increasing demand for lighting designers, suggesting that admirers of a “status interior” were more likely now to ask, “who lit it?” instead of “who did it?”<sup>714</sup> Defining the unique characteristics of the discipline, Slesin informed readers that, “The new lighting designers are neither electricians nor lighting salesmen. Some come from the theater, where lighting design is an acknowledged profession; others have backgrounds in engineering, architecture or, more recently, interior design.” Emphasizing the particular design expertise of such lighting consultants, she suggested the value of their services was demonstrated in, “their imaginative ideas and their knowledge of how to use lighting to set certain moods and create a functional modern interior.”<sup>715</sup> Slesin’s description of lighting designers, their methods, and contributions to the total effect of a project suggests that the efforts of so many individuals who dedicated their careers to advancing the field had finally found some resonance and recognition in both popular media and professional practice. However, such accounts as Slesin’s also underscored the fact that lighting design and the integrated planning of architectural illumination, more often than not, was still limited to prestige or “status” projects.

Despite such limitations, by the mid-1970s the combined efforts of the IALD and a number of prominent lighting consultants who advocated for the purpose and value of lighting design had been successful in realizing a small but thriving professional community. This period also witnessed the founding of the first Master of Fine Arts in Lighting Design at Parsons School of Design in New York City under the guidance of James Nuckolls, a well-respected lighting designer and educator who credited his passion for the discipline to his mentor, Stanley McCandless.<sup>716</sup>

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<sup>714</sup> Suzanne Slesin, “The Lighting Designer: Bright New Star,” *New York Times*, 8 Nov., 1979, C1.

<sup>715</sup> Ibid.

<sup>716</sup> Phil Tamulonis, “James Nuckolls,” *Architectural Lighting* (March 2001): <http://www.archlighting.com/lighting-designers/james-nuckolls.aspx>

As mentioned at the outset of this chapter, the burst of interest in lighting design in the later 1950s and its growing maturity and professionalization over the second half of the century, appears much less of a revelation or aberration when viewed in relation to the much larger and sustained history of the allied disciplines and persons that pursued the advancement of the science and art of lighting in the United States during most of the twentieth century. Many contributed to the development of this discourse—individuals from engineering, architecture, theater, design and the arts—introducing new methods and approaches, provoking new debates, and raising issues of professional interest and concern. Providing continuity across this diverse and at times loosely connected community, was a persistent revisiting of old issues, tensions, and prejudices that ultimately, one might argue, contributed to the development of the practices and professions responsible for the design and planning of electric light. Some festering concerns were muted, at least in part, with the branching off of lighting design from illuminating engineering in the 1950s and 60s, particularly in terms of determining the prioritization of science or art in methods of light planning. While such distinctions were important in defining both the role and requirements of artificial light in the built environment, for many lighting engineers and designers throughout the twentieth century, like Basset Jones at the turn of the century or Richard Kelly at its midpoint, it was never a question of the science *or* the art of lighting, but rather the sensitive integration of both. Kelly was careful to make this point in the conclusion of “Lighting as an Integral Part of Architecture,” writing with clarity and concision: “Lighting is both an art and a science.” Reaching back to the early part of the century and calling upon others who refused to make such distinctions, Kelly quoted Matthew Luckiesh, who wrote: “That which changes the mysteries of today into the commonplace facts of tomorrow is

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science in whatever guise.” In reference to Luckiesh’s definition of science, Kelly suggested that the discipline was now, “entering a new phase of mystery and magic.”<sup>717</sup>

That phase, as has been argued, had more in common with the phases that preceded it than it had differences. The “mystery and magic” of artificial light had fascinated generations of engineers, architects, designers and artists, all of whom brought their own needs, desires, methods and practices to bear on the exploration of light as a powerful medium in the control and manipulation of the visual environment. Cutting across disciplinary boundaries and infiltrating many of the contexts and conditions that shaped the built environment in the United States during the twentieth century, the history of lighting design is in no way straightforward. But it is a history that tells us much about each of its constituent elements and offers valuable insights into how the design of light informed and responded to American culture in the twentieth century.

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<sup>717</sup> Kelly, “Lighting as an Integral Part of Architecture,” 30.

## CULTURES OF LIGHT: CONCLUSION

With the advent of electric lighting and expanding distribution networks for electric power in the early twentieth century, the American public was confronted with ever more powerful and diverse illumination sources. How and where electric lighting was applied was always much more than a question of functionality or utility; it was and continues to be fundamental medium of cultural production and expression, with wide ranging economic, social, and political implications. From its introduction in the United States in the later nineteenth century, electric light was symbolically and ideologically wedded to the core characteristics of American national identity, and widely utilized in the popular expression and representation of these ideals. It was modern, technological, scientific, engineered, and abundant; but it was also dazzling, magical, spectacular, beautiful, and sublime. In this way it very much mirrored the culture it represented—as a young but ambitious nation, the United States could not compete with the centuries-old cultural traditions and achievements of Europe and Britain, but if the terms of engagement were changed, and technological innovation and industrial might were cast as evidence of cultural accomplishment and advancement, then the United States could be a world leader. Electric light played an important role in moving these goal posts—leveraging the international context and audiences of world's fairs and expositions, it was broadly and popularly utilized in the design and spectacular presentation of United States' fairs to embody and express ideological narratives defining national identity and as evidence of America's cultural preeminence as a modern industrialized nation. In this way electric light was so closely aligned, both symbolically and ideologically with the nation's cultural progress that it became indivisible from these notions and their expression? And importantly, the electric industry—controlled by what would become one of the largest American corporations in the twentieth century,

General Electric—was largely responsible for ensuring the technological and artistic innovation of the lighting at these fairs, as well as keeping these symbolic and spectacular expressions closely associated with their products and electricity. As the American historian and political scion Henry Adams proposed at turn of the century, symbolically electricity represented the great potential of American culture—and electric light was its most popular expression. Looking towards a century that would be revolutionized by the “absolute *fiat* of electricity,” as Adams had hinted, in the United States its force would contribute to a significant cultural transformation, one that displaced the power of the church, the Republican statesman, and class hierarchies, fostering a nation that prized most highly, the engineer, the consumer and the corporation.<sup>718</sup> These transformations were not the result of the introduction of electricity or electric light, but they are deeply imbedded within them.

By the early years of the twentieth century then, electric light was popularly understood as both distinctly American and modern. Its perceived modernity was in many ways a result of the relocation of the fire, heat, smoke and grime of previous illumination sources to central power stations and the site of the generation of electricity, which in conveniently consolidating such un-pleasantries made the “invisible mechanisms” of electric light possible.<sup>719</sup> This technological liberation of illumination, allowed a much greater diversity of applications and effects, the potential of which was enthusiastically explored by many across a diversity of disciplines. Regardless of professional orientation however, electric light was understood as a particularly modern medium, one that was inherently abstract, ahistorical, non-representative, but immediately emotive, expressive, and a conduit for unmediated aesthetic apperception. Particularly in the theories and practices of early stagecraft reformers, like Appia and Gordon Craig, electric lighting suggested viable means

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<sup>718</sup> Henry Adams, "The Dynamo and the Virgin," in *The Education of Henry Adams, 1918* (New York: First Vintage Books, 1990), 352-362.

<sup>719</sup> Cheney and Cheney, 200-201.

and mechanisms of achieving truly modern compositions and aesthetic experiences. In the United States such understandings of electric light and its potential for modern expression were closely associated with the development of the industrial designer, as suggested by Sheldon and Martha Cheney, as well as the emergence of a new modern American aesthetic indicative of the machine age and the characteristic strengths of the United States established in the rhetoric of world's fairs before the turn of the century. MoMA's Alfred Barr also sought to bring together such associations to "end the divorce" between American industry and culture, creating a new definition of art, situating this reconciliation of the machine and modern art within the aesthetic requirements of the consumer marketplace. Here again electric light had a valuable role to play, enhancing and glamorizing the surface qualities of mass-produced goods, such that "sensuous beauty" of their material qualities could be appreciated, sidestepping the banal or commercial function of these object. Using Barr's words, electric lighting not only helped "bind Frankenstein"—Frankenstein being a product of American industry and consumer culture—but moreover, made "him beautiful."<sup>720</sup> Such machine age ideals were equally applied to American architecture and interiors, where again electric illumination was celebrated for the way in which it could define spatial volumes, accent or draw out architectural details, and articulate specific surface textures and enhance colors. Providing an alternative to traditional architectural ornament and decorative elements, electric light, and indirect illumination in particular, offered a highly adaptable mechanism for enhancing a range of modern materials and surface effects and suggested for some the possibility of a new architecture of light.

Such notions linking electric light with visual enhancement and aesthetic transformation also infiltrated popular discourse on female beauty and identity, particularly in relation to the domestic environment. Just as electric light was heralded for its ability to

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<sup>720</sup> Barr, Jr., "Forward," *Machine Art*.

transform the sensual perception of industrial objects and modern architectural surfaces, it was similarly promoted to women as a widely applicable visual enhancer, attributed with the capacity to maximize a woman's beauty as well as that of her environment, including everything and everyone within it. Such messages—largely crafted and disseminated by the electric industry—were framed in relation to well-established gendered roles and expectations, and played upon a host of social anxieties that typically involved embarrassment, shame, or rejection for the woman if electric lighting was not used as recommended. Such industry generated rhetoric started as early as the 1920s and continued throughout the first half of the century, reaching something of a crescendo in the immediate postwar environment when the ambitions of the electric industry collided with the intense focus on the home, consumer spending, and the women at the center of both. Like the other cultures of light examined in this thesis, electric light was a part of larger social, economic and political negotiations, here directly engaging with and impacting women's roles and responsibilities, as well as popular expectations of them—including labor in and outside of the home, social agency and acceptance, domestic and familial management, and personal expressions of beauty, personality, and identity. Electric light, while relentlessly promoted by the industry, offered women a greater diversity of options in addressing and mediating these larger cultural shifts.

All of these investigations, explorations and reinterpretations of various aspects of American culture and society through or in tandem with new and expanded uses of electric light were aided by the efforts of the electric industry and those that chose to dedicate their professional lives to the development and advancement of electric lighting applications and practices. While the electric industry appears consistently and prominently across the whole of this history, the discipline that began as illuminating engineering in the first decade of the twentieth century, and which bifurcated in late 1950s with the emergence of lighting design,

requires closer attention. Developing in the early stages on as a subset of electrical engineering—partially in response to the extraordinary demands of designing and executing the large scale electric lighting displays at world’s fairs—illuminating engineering held a precarious position for many years, caught between engineering and architecture, and science and art. From the founding of the I.E.S in 1906, consensus regarding the primary role of the illuminating engineer as well that of electric lighting in architecture was contested, both within the discipline as well as within architecture and architectural practice. The technologies of lighting and architecture changed rapidly and steadily during the first half of the twentieth century—an unsteady ground for any practice, and a situation further complicated by the relentless push of modernism and the aesthetic overhaul of architecture it demanded. These tensions and disciplinary prejudices proved difficult to resolve, and one might argue, are still identifiable today. Indeed, looking closely at the terms set out by lighting designers in the 1950s to distinguish themselves professionally from both engineering and architecture, and to define their practice, ethos, and ethics, reveals much about the persistence of these tensions and the ways in which they constricted the advancement of lighting practices since the beginning of the century.

Pulling back once again to look broadly at the first half of the twentieth century, we see how electric light cut across many boundaries, shaping and being shaped by a wide range of cultural beliefs and practices—from its role in defining a national identity that called upon the distinctive strengths and characteristics of the USA, to the codification of the ideological and aesthetic tenets of American modernism, to the renegotiation of women’s roles as consumers and guardians of the American family and home, to the complex and intimate co-development of modern architecture and lighting design. While there are many points of difference in each of the historical themes examined in this thesis, there are just as many points of connection and areas of overlap. What is so valuable in identifying and analyzing

both the intersections and diversions is what they tell us about the cultural history of electric lighting in the USA, that is to say, how electric lighting, in the hands of those who sold it, designed it, imagined and consumed it, carried and communicated meaning. Much more than simply a technology for producing visible light, it was and continues to be a medium of culture, and when studied in this manner, a mechanism for making key aspects of that culture more visible.

## ACKNOWLEDGMENTS

Developed over an extended period of time—spanning a decade chronologically, and both hemispheres geographically—my thesis has benefited from the wisdom, guidance, support, and generosity of a number of scholars, mentors, supervisors, and colleagues. I was fortunate to have begun my study at the Bard Graduate Center in New York City under the supervision of Professor Amy Ogata, who did much to help me shape my research, sharpen my skills as a historian, and persevere through a number of lean years when real progress on my thesis seemed impossibly out of reach. This extended period of study however, also allowed me the benefit of being able to both share my research and work with some tremendous mentors, who have been so generous with their time and support, contributing much to my thinking about the cultural history of electric lighting, most significantly Dietrich Neumann, Sandy Isenstadt, Alice Friedman, and Pat Kirkham. I would also like to thank a number of individuals who kept me on this path and provided encouragement when it was most needed, including Addison Kelly of USA Lighting Consultants for allowing me incredible access to Richard Kelly's papers; Peter Wheelwright, Joanna Merwood-Salisbury, and Derek Porter for welcoming me into the MFA Lighting Design Program at Parsons, fueling my passion for this topic; Simon Fraser and Eli Feth of Victoria University's School of Design for providing financial, administrative, and moral support for my research; my many generous colleagues at Victoria's Faculty of Architecture and Design for their scholarly guidance and collegial encouragement during my tenure at VUW; Marc Aurel Schnabel, my secondary supervisor and Chair of the School of Architecture's Research Committee, whose efficiency is only exceeded by his enthusiasm; and Mandy Thomas, Executive Dean for the Creative Industries Faculty, Queensland University of Technology, for giving me the time and courage to finish this project, and as well as so many others who I am not able to mention here.



Finally, I owe extraordinary thanks to my primary supervisor at Victoria University, Professor Brenda Vale, without whom this thesis surely could not have been completed. I am grateful for her tireless attention to detail, keen eye for weak prose and tenuous statements, unbeatable speed in reviewing drafts, and most of all, her kind and gentle support. My acknowledgements could not be complete however, without offering my deepest and most sincere gratitude to my partner Jason, for his enduring support of this project and unwavering faith in my abilities, as well as to Millie and Emmett, who have inspired me much more than they have distracted me throughout it all.