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The Ware Course: Architecture as a Useful, Liberal, and Fine Art

By

Kevin P. Block

A dissertation submitted in partial satisfaction of the

requirements for the degree of

Doctor of Philosophy

in

Rhetoric

in the

Graduate Division

of the

University of California, Berkeley

Committee in charge:

Professor Pheng Cheah, Co-Chair
Professor Andrew Shanken, Co-Chair
Professor David Henkin
Associate Professor Winnie Wong

Fall 2019

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Abstract

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by

Kevin P. Block

Doctor of Philosophy in Rhetoric
University of California, Berkeley

Professor Pheng Cheah, Co-Chair
Professor Andrew Shanken, Co-Chair

This dissertation examines the academic career of William Robert Ware (1832-1915), an American architect who became the leading architectural educator in the late nineteenth century. Previous accounts of Ware have focused either on his work as a practicing architect or his role as a department builder at the Massachusetts Institute of Technology and Columbia University, where he imported the Beaux-Arts system of design instruction to the United States. This dissertation, in contrast, interprets archival documents and nineteenth-century architectural theory to situate Ware in relation to a number of core questions and concepts in the broader history of architectural expertise, including the construction of professional authority, the meaning of culture, the use of judgment, and the tension between creative expression and information processing. In addressing these core questions and concepts as a pedagogue, Ware helped to embed architectural education within the institutional setting of the modern research university and—for a brief historicist moment near the turn of the century—transform the discipline from a useful art into a liberal art.

Part I covers the first half of Ware's career at the Massachusetts Institute of Technology (M.I.T.) and the relationship of architectural education to drawing reform in the 1860s and 1870s. In the Introduction to Part I, I explain how Ware's involvement with the 1870 Drawing Act helped to expand the relevancy of architectural expertise from its traditional concerns with the construction and design of buildings to the general problem of producing and coordinating skillful labor. The public supported M.I.T. and M.I.T. supported Ware's architecture department because they recognized in architectural education a source of technical rather than artisanal or aesthetic competency. Architectural education received institutional support in New England not because of professional lobbying, but because the discipline became associated with economic development and the useful arts tradition.

In Chapter One, I consider why the legislators of the 1870 Drawing Act would have sought out Ware's involvement, or what constituted Ware's professional persona given his limited experience as an architect. I argue that Ware's credibility derived from his institutional affiliation with M.I.T. and from his travels in Europe, where he studied

different methods of drawing instruction in art academies and polytechnics. In Chapter Two, I argue that art and education reformers like Walter Smith, Charles Eliot, and John Runkle set the groundwork for the incorporation of architecture within the university. This chapter proceeds over four sections. First, I briefly review literature in economic history on the collapse of the American apprenticeship system. In the next section, I describe how skill emerged as an abstract category of economic thought as work shifted from artisanal to industrial production and how abstraction changed the meaning of skill. These two sections constitute what one might call the social problematic that drawing education attempted to address. Then in the third section, I describe the desire for managers and workers with technical drawing skills as part of a system of industrial remote control. Most advocates of the 1870 Drawing Act supported drawing education for this reason, as part of a technological system that was dependent on precise interactions between workers and machines. In the fourth section, I describe drawing education as the subject of a broad institutional critique, one that was supported by new theories of mind that made the university more receptive to visual disciplines like architecture.

Part II covers Ware's move to Columbia and the architecture program that he created there between 1881 and 1902. In the Introduction to Part II, I argue that Ware's move to Columbia was motivated by his objective to make the discipline of architecture a liberal art and I suggest what "liberality" meant to him in relation to how he understood terms like culture and judgment.

Chapter Three focuses on the disciplinary legitimation of architecture within the modern research university. I argue that Ware's liberal course in architectural education, with its heavy emphasis on the study of architectural history, was meant to demonstrate to administrators and colleagues in other academic disciplines that architecture conformed both to the university's culture of professionalism, which was based on the study of precedent, and to its culture of classicism, which was defined by the interpretive methods of philology. In conforming the discipline to these two cultures, Ware's program secured an institutional order that would help American architects avoid the perils of eclecticism. Chapter Four describes the key instrument that Ware and his successor, A.D.F. Hamlin, used to institutionalize his historicist model of architectural education at Columbia: the Avery Architecture Library. In the early 1890s, architecture students in New York could study the history of architecture in museums like the Metropolitan Museum of Art, with its extensive collections of plaster casts, and in universities like Columbia, with its collection of casts and architectural books. By the turn of the century, however, it was clear that the future of architectural education would be in the university and textual, not in the object-oriented environment of the museum. This chapter therefore considers the growth of the Avery Library and its impact on the architecture curriculum at Columbia.

I conclude the dissertation with a discussion of Ware's dismissal from Columbia in 1902 and the growing division of architectural labor around the turn of the century. While celebrated architects like Charles McKim after the turn of the century tried to enclose the collegiate system of architectural education to produce an elite cadre of fine artists,

Ware tried to make this system more accessible by collaborating with the International Correspondence School to create a series of rudimentary architecture courses that could be completed through the postal system. Ware's dismissal was indicative of a cultural hierarchy in modern America that made a university education a barrier rather than a gateway to the pursuit of architecture as a fine art. As a figure who determined much of what constituted expertise for American architects around the turn of the century, Ware's legacy was ambiguous. While the university grounded the discipline within an institutional order and provided instruments like the Avery Library that were necessary for producing liberal architectural subjects, access to this institutional order and these resources remained severely constrained.

Table of Contents

Dedication	ii
List of Figures	iii
Acknowledgements	x
Introduction	1
Part I: Architecture as a Useful Art	13
Introduction to Part I: The 1870 Drawing Act	
Chapter One: Professional Self-Fashioning: Building Credibility, Becoming Expert	21
Chapter Two: After Apprenticeship: Drawing and the Need for Skill in the 1870s	36
Part II: Architecture as a Liberal Art	59
Introduction to Part II: Ware's Move to Columbia	
Chapter Three: Architecture in the Age of University Reform: Professionalism, Classicism, and the Study of Architectural History at Columbia	86
Chapter Four: Schooling Design: The Avery Library and the Bibliographic Order of Collegiate Architecture	123
Part III: Architecture as a Fine Art	161
Conclusion: Captains of Erudition and the Collar Line	
Bibliography	173
Visual Appendix	204

Dedication

I dedicate this dissertation to my whole family, especially my parents, for their constant love and support.

List of Figures

Introduction

Figure 1. William Robert Ware circa 1865. M.I.T. Special Collections.

Introduction to Part I

Figure 2. Walter Smith. From Green (1966), p. 8.

Figure 3. Cover-page to Walter Smith's *American Text Books of Art Education: Geometrical Drawing* (James R. Osgood & Co., 1873).

Figure 4. Learning to draw models, from Smith's *American Text Books of Art Education* (1873).

Chapter One

Figure 5. Ware's first large project: Harvard's Memorial Hall, final exterior perspective. The building would not be completed until the late 1870s. Courtesy of Harvard University Archives (Collection #166).

Figure 6. The original seal for the Massachusetts Institute of Technology. Courtesy of MIT Institute Archives and Special Collections.

Figure 7. Rogers Building (1866), Massachusetts Institute of Technology. Courtesy of MIT Institute Archives and Special Collections.

Figure 8. Freshman drawing room, Rogers Building, Massachusetts Institute of Technology. Courtesy of MIT Institute Archives and Special Collections.

Figure 9. Cover-page to Ware's *Outline* (1866).

Chapter Two

Figure 10. The cover-page of Eggleston's *How to Educate Yourself: With or Without Masters* (1872).

Figure 11. The cover-page of Edward Shaw's *The Modern Architect; or, Every Carpenter His Own Master* (1854).

Figure 12. Cover-page of J.G. Chapman's *The American Drawing-Book* (1847).

Figure 13. Walter Smith's *Art Education, Scholastic and Industrial* (1873).

Introduction to Part II

- Figure 14. William Ware and the architecture faculty at Columbia's School of Mines. Avery Archives, Columbia University.
- Figure 15. Sarah Goodridge. *Reverend Henry Ware, Jr.* Approx. 1828. Watercolor on ivory. 9.2 x 7.3 cm (3 5/8 x 2 7/8 in.). Museum of Fine Arts, Boston.
- Figure 16. Charles Osgood. *Henry Ware Sr.* 1835. Oil on canvas. 91.9 x 71.7 cm (36 3/16 x 28 1/4 in.). Harvard University Portrait Collection, Harvard Art Museum.
- Figure 17. Title page to William Ellery Channing's *Self-Culture* (1838).
- Figure 18. A site plan from George Whitwick's *The Palace of Architecture* (1840).
- Figure 19. Thomas Cole. *The Architect's Dream.* 1840. Oil on canvas. 53 x 84 1/16 in. x 84 1/16 in. Florence Scott Libbey Bequest, Toledo Museum of Art.
- Figure 20. C.R. Cockerell. *The Professor's Dream.* 1848. Drawing in pencil, pen & gray ink and watercolour, with scratched highlights. 1122 mm x 1711 mm. Royal Academy of Arts.

Chapter 3

- Figure 21. The Engineering Experiment Station at the University of Illinois. "The College of Engineering and Engineering Experiment Station of the University of Illinois: A Pictorial Description," *University of Illinois Bulletin*, XVI, no. 19 (January 6, 1919).
- Figure 22. "Materials Testing Laboratory." The Engineering Experiment Station at the University of Illinois. "The College of Engineering and Engineering Experiment Station of the University of Illinois: A Pictorial Description," *University of Illinois Bulletin* XVI, no. 19 (January 6, 1919).
- Figure 23. "Materials Testing Laboratory" (cont.). The Engineering Experiment Station at the University of Illinois. "The College of Engineering and Engineering Experiment Station of the University of Illinois: A Pictorial Description," *University of Illinois Bulletin* XVI, no. 19 (January 6, 1919).
- Figure 24. A plan of Low Library, including the Law Library and the Avery Library. University Archives, Columbia University.
- Figure 25. Warren's "The Use and Abuse of Precedent" (1893) in the *Technology Architectural Review*.

- Figure 26. Stanford White's New York Herald Building (1895). From Warren (1893).
- Figure 27. The Palazzo del Consiglio in Verona, Italy (1476). From Warren (1893).
- Figure 28. The American Fine Arts Society in New York City (1892). From Warren (1893).
- Figure 29. King Francis I's Hunting Lodge in Paris (16th century). From Warren (1893).
- Figure 30. Ware's *The American Vignola* (1902).
- Figure 31. Schleicher's *Stammbaumtheorie*, or "family tree" model of the Indo European languages. Originally published in his *Deutsche Sprache*, "German Language" (1860). Reproduced from Alter (2003).
- Figure 32. Banister Fletcher's appropriation of Schleicher's family-tree model of linguistic descent to represent the history of architectural style (1896).
- Figure 33. Title page of Norton's *Historical Studies in Church-Building in the Middle Ages: Venice, Siena, Florence* (1881).
- Figure 34. Ware's rendering for the American School of Classical Studies in Athens. From the ACSA Digital Library.
- Figure 35. The American School of Classical Studies during construction. From the ACSA Digital Library.
- Figure 36. The American School for Classical Studies soon after completion. From the ACSA Digital Library.
- Figure 37. The library for the American School of Classical Studies in Athens. From the ACSA Digital Library.
- Figure 38. Title page for Reber's *History of Ancient Art*.
- Figure 39. Student tracing exercise from Ware's "The Instruction in Architectural Drawing at Columbia University" (1896).
- Figure 40. Student brushwork exercise from Ware's "The Instruction in Architectural Drawing at Columbia University" (1896).
- Figure 41. Student pen-work exercise from Ware's "The Instruction in Architectural Drawing at Columbia University" (1896).

- Figure 42. Tracing notebook of Farnese Palace in “Ferg” for “Hamlin History of Arch course.” From Lucian E. Smith Collection, 1890-1940, Avery Archives, Columbia University.
- Figure 43. Tracing notebook of molding fillets in the Early English style for “Hamlin History of Arch course.” From Lucian E. Smith Collection, 1890-1940, Avery Archives, Columbia University.
- Figure 44. Tracing notebook of ornamental glazing patterns from “Clayton L. Bell’s Catalogue” for “Hamlin History of Arch course.” From Lucian E. Smith Collection, 1890-1940, Avery Archives, Columbia University.
- Figure 45. Tracing notebook of escutcheons in the French Gothic style for “Hamlin History of Arch course.” From Lucian E. Smith Collection, 1890-1940, Avery Archives, Columbia University.

Chapter Four

- Figure 46. Henry Ogden Avery. From H.O. Avery Collection, Avery Archives, Columbia University.
- Figure 47. Samuel Putnam Avery, the engraver. From the Samuel Putnam Avery Papers, Metropolitan Museum of Art.
- Figure 48. Samuel Putnam Avery, President of the Grolier Club (1896-1900). From H.O. Avery Collection, Avery Archives, Columbia University.
- Figure 49. “...Far more seemely were it for thee to have the Study full of Bookes than thy purses full of mony.” The bookplate to Samuel Putnam Avery’s library. From H.O. Avery Collection, Avery Archives, Columbia University.
- Figure 50. The Cast Courts as the South Kensington Museum, featuring a plaster cast fragment of Trajan’s Column. From Flour (2008).
- Figure 51. Plaster casts in the Cour Vitree of Duban’s Palais des Etudes. From Lending (2017).
- Figure 52. Architectural casts in Blackstone Hall, Art Institute of Chicago and plan of the Institute. From Saliga (1990).
- Figure 53. The cover of the Metropolitan Museum of Art’s 1892 “Report” of the Special Committee to Enlarge Collection of Casts.
- Figure 54. Architectural lecture and drawing rooms in the Rogers Building, M.I.T. MIT Archives. Reprinted in Wigley (1991).

- Figure 55. Photograph of Chaplain's 1893 bas-relief memorial for the Avery Alcoves. From H.O. Avery Collection, Avery Archives, Columbia University.
- Figure 56. Drawing of Chaplain's bas-relief memorial, included in the "Catalog of the Avery Library."
- Figure 57. Reiff's graph for the increase in architectural books published in the United States between 1801 and 1890, based on Hitchcock's inventory. From Reiff (2000).
- Figure 58. The cover to the original 1895 *Catalogue of the Avery Architectural Library*.
- Figure 59. Classification scheme by subject from the 1895 *Catalogue of the Avery Architectural Library*.
- Figure 60. Harriet B. Prescott, cataloguer of the Avery Library. From Mount Holyoke archives.
- Figure 61. Charles Haight's interior design for initial installation of the Avery Alcove from H.O. Avery Collection, Avery Archives, Columbia University.
- Figure 62. Haight's School of Mines Building on 49th Street. From School of Mines Collection, University Archives, Columbia University.
- Figure 63. The expansion of the Avery Alcove in Low Library. From Avery Archives. From the H.O. Avery Collection, Avery Archives, Columbia University.
- Figure 64. Avery Hall, front elevation. Avery Hall Collection, Avery Archives, Columbia University.
- Figure 65. Avery Hall, first floor plan. From Smith (1914).
- Figure 66. The interior of the Avery Library in Avery Hall. From Smith (1914).
- Figure 67. Plan of Robinson Hall, from Alofsin (2002).
- Figure 68. Hall of Casts in Robinson Hall. From Pearlman (1997).
- Figure 69. The central corridor on the top floor of Havemeyer Hall. From Stuart (1900-1901).
- Figure 70. The book lifts in Avery Hall, detail from first floor plan. From the Avery Hall Collection, Avery Archives, Columbia University.

- Figure 71. The book lifts in Avery Hall, fourth floor plan. From the Avery Hall Collection, Avery Archives, Columbia University.
- Figure 72. Christopher Pearse Cranch's 1836-1838 illustration of the "Transparent Eyeball" in Emerson's "Nature" essay. From Cranch Collection, Houghton Library, Harvard University.
- Figure 73. Henry Hobson Richardson's private study and library in Brookline, Massachusetts. From O'Gorman (2007).
- Figure 74. Hubert Von Herkomer's 1886 portrait of Henry Hobson Richardson. National Portrait Gallery, Smithsonian Institute.

Conclusion

- Figure 75. The 1898 Administration Building of the International Correspondence School of Scranton, Pennsylvania. McHugh Special Collections, Scranton University Archives.
- Figure 76. The new I.C.S. Administration Building and Printery in Scranton, built in 1915. McHugh Special Collections, Scranton University Archives.
- Figure 77. The American Correspondence School at the Armour Institute of Technology in Chicago. From *The Draftsman* (1901).
- Figure 78. Title page for *A Treatise on Architecture and Building Construction* (1899), accompanying the I.C.S.'s Complete Architectural Course.
- Figure 79. From Ware's *Shades and Shadows* (1912).
- Figure 80. "Telegrapher to Architect Through the I.C.S." From *Wilshire's Magazine*. Courtesy of McHugh Special Collections, Scranton University Archives.
- Figure 81. "Carpenter Becomes Architect," *The National Builder* 34 (February, 1903), 7.
- Figure 82. "Are You Held Down," *The National Builder* 34 (November, 1903), 7.
- Figure 83. "Are You a Cog?" *The National Builder* 34 (October, 1903), 7.
- Figure 84. "Better than Money, Architecture Taught by Mail." *Architects' and Builders' Magazine* 1 (December, 1899), 29.

- Figure 85. Nicholas Murray Butler in 1921. Prints and Photographs Online Catalog, Library of Congress.
- Figure 86. Title page for the A.I.A.'s *The Promise of American Architecture* (1905), including Nicholas Murray Butler's address "The Place of Art in Civilization."
- Figure 87. Ware after his academic retirement, serving as a jury member for the Palace of Peace design competition in 1906. From *International Competition of the Carnegie Foundation, the Palace of Peace at The Hague* (London: T.C. & E.C. Jack, 1907).
- Figure 88. Ware, from Hamlin's obituary for his mentor. *Journal of the American Institute of Architects* 42 (July 1915), 101.

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Introduction:

Architecture and Expertise

In 2000, Barbara L. Allen and Roberta M. Feldman edited an issue of the *Journal of Architectural Education* that was devoted to moving “Beyond Expert Culture.”¹ The issue represented an entire generation’s frustration with the elitism and social irrelevancy of architectural modernism. At the start of the new millennium, architectural culture needed, in Allen and Feldman’s words, a more “progressive relationship between knowledge and citizenship in the shaping of the places in which we live.”² Moving “beyond expert culture” required that the public reject its debilitating dependency on professional authority, which the authors believed characterized Western society in general. Allen and Feldman believed that expertise was directly correlated with the debilitation of the public. In the age of professionalism, they wrote, “the expert’s role is to instill better design in a public body rife with bad taste and illegitimate ideas about its environment.”³ Their recommended alternative to the rule of experts was to hybridize the epistemological basis of architectural practice. To become, in short, reflexive practitioners who coordinated the design of the built environment as public advocates or citizen-architects rather than dictating the design as experts.

The call to move beyond expert culture can be seen as the culmination of a forty-year critique of architectural professionalism in the United States. In the 1960s and early 1970s, many architects were influenced by Jane Jacobs’s *The Death and Life of Great American Cities* (1961) and the resistance to master planners like Robert Moses, Bernard Rudofsky’s turn to vernacularism in *Architecture Without Architects* (1964), John Turner’s self-help housing paean in *Freedom to Build* (1972), the participatory mantra of design radicals and hippie modernists, and a growing regionalist and preservationist ethos that care for local conditions more than an international style. For many who belonged to this countercultural generation, professionalism was equivalent to corporate modernism—aesthetically and socially alienating. Later, postmodernists like Robert Venturi and Denise Scott Brown rebelled against the stylistic mandates of professional design. Meanwhile, sociologists of architecture with Marxist inclinations like Magali Sarfatti Larson, in books like *The Rise of the Professions* (1977) and *Beyond the Postmodern Façade* (1993), rebelled against the very structure of professionalism.⁴

The call for architecture to move beyond expert culture sounds different today, when architects, like all other professionals—from climate scientists and public health officials to journalists and university professors—face a disconcerting rise in political and digital populism across the world. While some aspects of this populist surge may indicate a revitalized public sphere, the trend may also reflect the perversion of democratic culture. Several commentators from the political, scientific, and professional establishment have started to bemoan the “death of expertise.”⁵ Communication technologies like the internet and social media, once celebrated as a means of broadcasting news and

information to an enlarged public sphere, now seem to have precipitated a widespread crisis of professional credibility, immersing the public in personal opinion and alternative facts. A seismic shift has rattled the older structures of authority in liberal societies, demanding professional communities to be more proactive in explaining the nature of their expertise and why it is a social good. Like every other professional community, if architects do not take a more active approach to explaining what constitutes their expertise and why it is a social good, they will lose credibility and public support. Aside from the market consequences of this loss, it will hamper the profession's attempt to address critical issues related, for instance, to the sustainability, equity, and beauty of the built environment.

And yet while public skepticism of different kinds of expertise has moved from the political left to the political right and now appears to be growing, the fact remains that in the world of contemporary architectural practice, few have even attempted to move beyond expert culture. Architectural expertise is now predicated on the ability to utilize digital design software and manipulate computational algorithms, which few members of the public understand. Some have also argued that architectural expertise has shifted from a formal or spatial attribute to the ability to control the increasingly complex production process through the use of technologies like Building Information Modelling.⁶

What's more, the global distribution of architectural expertise between large design firms in the West's major cultural capitals and the rest of the world remains uneven.⁷ Instead of addressing the inequality head on, firm leaders depend on this uneven distribution to survive in quickly liberalizing economies, or else they seek to eliminate more menial or time-consuming production tasks through automation. Legal instruments like the 2008 Canberra Accord make it possible for a small group of architectural experts to distribute their services internationally by facilitating the portability of educational credentials around the world.⁸ While this makes it easier for design professionals from Australia, Canada, China, the United Kingdom, South Korea, Mexico, and the United States to work overseas, it also helps to preserve a dearth of expertise in places like India, Vietnam, Central America, and the rest of the Global South. Finally, the distribution of expertise in the educational sector is similarly uneven. Chinese students now rush to design schools in Europe, the United States, and Australia for their education and to earn the distinction of a foreign diploma, just as elite Americans sought entry into the Parisian ateliers of the École des Beaux Arts in the nineteenth century. They are forced to study abroad, if they have the financial resources, because the expansion of the domestic educational sector in the arts and design lags far behind population growth. It is difficult to believe, in short, that architectural practice or architectural education has become less expert over the last twenty years.

Of all the possible reasons why the architectural community has not moved beyond or at least addressed its persistent expert culture, the one that architectural historians are perhaps best qualified to propose is the reality that architectural culture, either within the schools or the profession, has never operated with a sufficiently nuanced understanding of expertise. What kind of authority is expertise? How do professional organizations like

the American Institute of Architects (A.I.A.) claim and regulate expertise? How does the collegiate system of architectural education reproduce or change it? In posing these kinds of questions we are preparing for a future in which architects remain influential public figures and agents of reform, whether or not the professionalism as we have come to know withers away.⁹

In part, this conceptual lacuna surrounding the question of expertise is a legacy of architecture's artisanal past. Prior to the modern period and really up until professionalization in the nineteenth century, the skill of design was architecture's *art* and the knowledge that informed the design and construction of a building was the *mystery* of the craft of building. In order for guilds to maintain control over the supply of their services, master builders and architects intentionally kept the nature of their expertise vague. Only through the completion of an apprenticeship and the ritualized swearing of oaths did one learn the mysteries of the trade.¹⁰

Trade secrecy as a method of controlling expertise changed radically with the expansion of science and technology in the eighteenth and nineteenth centuries. In the United States, near the end of the colonial period, according to historian W.J. Rorabaugh, outsiders "developed new techniques that destroyed the value of secrets customarily passed from generation to generation."¹¹ The growth of the print industry and the rise of mass literacy incentivized craftsmen in the building trades to publish accounts of their knowledge and techniques. Over the course of two centuries, a popular market developed in the United States for architectural literature that included how-to manuals, encyclopedias, pattern books, and architectural histories that tried to explain the building and design process, quickly exceeding in sum the amount of knowledge that any single master could possess.¹² The quintessentially Enlightenment process of codifying architectural knowledge took off, with authors translating rules-of-thumb into formal principles. Manual techniques and "sacred geometries" became formulas and best practices that a student might learn in a mechanics' institute. As the flood of new knowledge undermined the apprenticeship system and led to all sorts of wild experimentation, architecture professionals looked to the university to impose order. Formalized knowledge, as opposed to the art and mystery of craft knowledge, enabled a new system of credentialing and licensure that seemed to be more transparent and innovative than the old guilds.¹³ Architecture schools and architectural professionalism developed in lockstep from that point forward. The schools were necessary to prepare the young to enter the profession. The authority of the profession was necessary to certify the schools.

Despite the expansion of architectural knowledge in the modern period and the displacement of secrecy as a mechanism of control, the early leaders of American architecture's professionalization movement never spent much time or effort differentiating professional authority from expert knowledge. Disentangling the history of expertise from the history of professionalism is therefore a necessary first step in building a better theory of expertise in architectural culture. Thankfully, there is both a substantial literature on the history of architecture as a profession and a growing,

interdisciplinary field in what one might call “expertise studies” to help in the process of disentanglement.

The history of American architecture as a profession, best represented by the work of Mary N. Woods and Gwendolyn Wright, has been deeply influenced by the history of professionalism in general, an immense field of study shared by historical sociologists and social and cultural historians.¹⁴ Building on the work of A.M. Carr-Saunders in the 1930s and Talcott Parsons in the 1950s, members of the “Golden Age” of the sociology of the professions in the 1960s and 1970s created a “constellation of characteristics” that defined professionalism by triangulating Marx, Weber, and Durkheim. Historians of different professional communities and of professionalism in general like Burton Bledstein, Thomas Haskell, and Samuel Haber then began to add historical accounts of the professionalization process to the record. Following Parsons, the assumption of many of these sociologists and historians was that professionalism was laudable because it helped to ensure a social order that was not wholly beholden to either the dictates of the state or the free market. Professionalism represented a third way of ordering society based on a non-hierarchical organization and intellectual authority.¹⁵

In the sociology of the professions, expertise was one of the four central characteristics of a professional constellation, along with formal autonomy (via licensing, registration, or another means of regulating community membership), a normative orientation toward the service of others (e.g. an ethical code and taboos against explicit commercialization, such as advertising), and high status, income, and other social rewards.¹⁶ While each professional project claimed a different territory of expertise, the professional-managerial class as a whole legitimized its social status by claiming to possess and apply special knowledge for the public’s benefit.¹⁷ This constellation of characteristics did not always make it easy to determine which occupational groups really merited the title of professional. Harold Wilensky jokingly referred to “the professionalization of everyone” in an influential article about the tendency for all members of the middle class to claim a professional identity, from beauticians and athletes to sanitation workers.¹⁸

There are now many critics of the prevailing theory of professionalism, but perhaps the most helpful contribution that historical studies of professionalization have made is to restrict the category of the professions to a specific time and place. Professionalism is a nineteenth-century, Anglo-American phenomenon. There is no equivalent category native to Continental Europe or the rest of the world, which is why scholars from these areas have rarely felt compelled to study it.¹⁹ This fact gives architectural historians all the more reason to widen our historical and geographical scope by shifting terms of analysis from professionalism to expertise, a concept that in recent years has grown in scholarly popularity.

Scholars of architectural practice have been heavily influenced by the model of professionalism that sociologists and historians established by 1980. One conclusion that these architectural scholars made is that architecture should be characterized as a “weak profession” in comparison to the benchmark set by American lawyers and doctors. Despite the high social status afforded to architects as a creative figures who

combine technical knowledge with good taste, architectural professionalism under the leadership of advocacy institutions like A.I.A. never secured the same level of autonomy within the real estate and construction industry as, for example, doctors did within the healthcare sector, in part because its educational system and licensing procedure made it less restrictive.²⁰ The vast majority of buildings in the United States have not been designed by architects, after all. This relative lack of autonomy explains why architects do not receive compensation as high as many of their professional peers. Scholars of architectural practice have also followed sociologists in using place-based ethnographic methods to study architectural work. Oftentimes, this means observing the day-to-day life of an architectural office. While there are obvious limitations to ethnographic projects, these accounts have helped to displace antiquated notions of creative genius by describing architectural expertise in distributive terms, as the product of effective collaborations that are mediated by objects like drawings, models, and legal contracts.²¹

Roughly speaking, expertise studies is split between two discourses: behavioral psychology and the history, anthropology, and sociology of science. On most college campuses, expertise is a topic of research in psychology departments, information and computer science departments, and in schools of education. If one looks, for example, at the list of contributors for *The Cambridge Handbook of Expertise and Expert Performance*, 35 out of the 78 contributors are members of psychology departments, by far the largest affiliation.²² The next most prominent group are researchers in the rapidly developing fields of artificial intelligence and machine learning who belong to information schools and computer science departments. Since Berkeley professors Stuart and Hubert Dreyfus developed their five-stage model of skill acquisition in 1980, expertise has served as a conceptual heuristic for researchers in these fields to distinguish the intuitive capacities of highly-trained humans from machines.²³ The highly-structured game of chess, for example, has used as a way to distinguish human expertise at pattern recognition from sheer computing power. According to Anders Ericsson in one of the most widely-publicized pieces of research in expertise studies, expertise required at least 10,000 hours of deliberate practice.²⁴ Do anything for that amount of time—practice a musical instrument, play a sport, surgically repair knees—and one should become an expert performer (or at least that was how most members of the public interpreted Ericsson’s work).

As interest in expertise has grown among behavioral psychologists, a small group of researchers have begun to turn their attention to architects and the experience of the built environment. For some, architectural expertise is demonstrated by individuals or systems that are able to apply “designerly ways of knowing,” or abductive reasoning, to structure complex design problems.²⁵ Then there are researchers who are interested in the proverbial hard-wiring of expertise, such as those affiliated the Academy of Neuroscience for Architecture, which aims “to promote and advance knowledge that links neuroscience research to a growing understanding of human responses to the built environment.”²⁶ While the Academy has mostly focused on producing knowledge related to how architectural users respond to different environments, it has already turned its attention to studying the minds of architects. One might say that mapping the

architect's mind with fMRI machines is the twenty-first-century sequel to the personality and creativity studies of architects that were popular in the mid-twentieth-century.²⁷

The second major discourse that comprises expertise studies is the history, anthropology, and sociology of science. Harry Collins and Robert Evans describe the turn to expertise as part of a third wave in science studies. Their account is not without its critics, but it is helpful for the purposes of summary.²⁸ In the first “positivist” wave, when most historians of science aimed to explain and celebrate great scientific discoveries, scientific expertise was taken for granted. Scientists were experts by virtue of being intelligent and by having received proper training from reputable centers of learning. Expertise was by its nature esoteric and required no further investigation. In the second, post-Kuhnian wave, researchers assumed almost *prima facie* that expertise was a social construction that depended on credibility and extra-scientific factors such as powerful social institutions to make experimental findings truthful.²⁹ Foucault's work on power-knowledge and governmentality and Bourdieu's work on distinction were popular references for some second-wave theorists of expertise.³⁰ Allen and Feldman's call for architecture to move beyond expert culture belongs here. In the third wave, researchers finally began to account for the acquisition of expertise at a more detailed level of analysis. Some approached expertise as the product of interactions or networks with lay communities; others have emphasized the use of tools, techniques of standardization and quantification, and different kinds of specific bodily or sensorial training regimens involve in expert labor.³¹ For me, the work of Lorraine Daston and Peter Galison on the history of scientific objectivity and judgment has been especially helpful and will be discussed in later sections of the dissertation. Daston and Galison stress that the history of objectivity is irreducibly intertwined with the history of subjectivity. One cannot account for expert authority or objective facts without also accounting for how ethical values like fairness, impartiality, or what they call “the will to will-lessness” set the epistemic conditions necessary for the production of scientific knowledge.³²

As one can see from this brief review, there are a variety of possible ways for architectural historians to incorporate new approaches to expertise in their own field of study. In the following dissertation project, *The Ware Course: Architecture as a Useful, Liberal, and Fine Art*, I present a case study that focuses on architectural education as a vital link between the concepts of expertise and professionalism. My contention is that architectural expertise is historically variable and that this variability is determined in large part by the values and capacities of the educational institutions that reproduce it. What this contention entails is that we recognize the professionalization movement in American architecture as simultaneously an “academicization” movement, for lack of a more elegant word. Many histories of the American architecture school and individual architecture schools exist, but they rarely make discussions of expertise a central concern or explain how the schools and the profession interact in order to reproduce architectural authority in a given historical moment.³³

Methodologically, my analysis combines architectural history with the history and theory of education, including art education and the liberal arts tradition. A central premise of

this argument is that educational institutions like the American university do not function as a mechanism for transmitting a static notion of expertise from one generation to the next. Neither do they serve exclusively as a space for developing autonomous, inward-looking disciplines. Instead, they are better likened to a forum or market in which one kind of expertise encounters other kinds of expertise and through this encounter learns how to respond to new social conditions. When American architecture entered the university, there is ample evidence that educators made an attempt to embrace the academic values and pedagogical techniques shared throughout the university. As I write in Chapter Three, around the turn of the century, architecture was not merely *in* the university; it was *of* it. For this reason, I try to suggest the interdisciplinarity of architectural education in this period whenever possible.

In this project, I have chosen to investigate questions of expertise through a case study: the academic career of William Robert Ware (FIGURE 1), the founder of the collegiate system of architectural education in the United States, without question the most influential American architectural educator of the nineteenth century. Though Ware's name appears in most histories of architectural education in the United States, he remains understudied and misunderstood. Although I try to correct some of these misunderstandings, I do not intend this case study to replace Chewning's excellent treatment of Ware's career at the Massachusetts Institute of Technology (M.I.T.) and try to engage readers who may be interested in questions the lead beyond the history of architectural education.³⁴ Instead of a revisionist biography, I have tried to use Ware's career at M.I.T. and Columbia University to track the transformation of architectural expertise over a half-century (from 1860 until 1910) in relation to three categories of knowledge: the useful arts, the liberal arts, and the fine arts. This epistemological scheme was partially inspired by Stephen Parcell's work on the historical definitions of architecture in the classical, medieval, and Renaissance periods.³⁵ Part I investigates the meaning of architecture as a useful art through an analysis of drawing reform and the question of skill in the 1860s and 1870s, when Ware created the architecture department at M.I.T. Part II follows Ware's move to Columbia and his attempt to transform architecture into a liberal art alongside Columbia's transformation from a classical college to a research university. Here judgment replaces skill as main determinant of architectural expertise. In the Conclusion, I consider the end of Ware's career in relation to growing academic interest in beauty and the fine arts and how some of these changes that took place in the latter half of the nineteenth century continue to affect architectural culture today.

There are some obvious limitations to such a narrow case study—the close frame of reference conceals the diversity of approaches that existed within the field of architectural education during this period, for example, and I am unable to address the structural tension between expertise and amateurism—but there are also benefits. By studying Ware's career as an unusually successful educator over roughly a half-century, we can begin to track the discipline's changing relationship to broad categories of knowledge like the useful, liberal, and fine arts. Ware always aspired to make architecture a liberal art, but his career began in the heyday of the useful arts and it abruptly ended once Columbia administrators began to embrace the fine arts. In other

words, the model of education that he created and the ways that he addressed perennial questions of skill, judgment, and creativity were contingent upon large, disruptive forces of technological and economic change and the institutional ballast of the university. As prism rather than a hero, we can study Ware with the present, similarly contingent state of architectural expertise in mind.

Endnotes to Introduction

¹ Barbara L. Allen and Roberta M. Feldman, "Introduction: Beyond Expert Culture," *Journal of Architectural Education* (1984-) 53, no. 3 (2000): 128–29.

² Allen and Feldman, 128.

³ Allen and Feldman, 128.

⁴ Jane Jacobs, *The Death and Life of Great American Cities*, A Vintage Book, v–241 (New York: Vintage Books, 1963); Bernard Rudofsky, *Architecture Without Architects: A Short Introduction to Non-Pedigreed Architecture*, Reprint edition (Albuquerque: University of New Mexico Press, 1987); John Turner and Robert Fichter, eds., *Freedom to Build: Dweller Control of the Housing Process*, First Edition edition (The Macmillan Company, 1972); Vincent B. Canizaro, ed., *Architectural Regionalism: Collected Writings on Place, Identity, Modernity, and Tradition* (New York: Princeton Architectural Press, 2007); Robert Venturi, Steven Izenour, and Denise Scott Brown, *Learning from Las Vegas - Revised Edition: The Forgotten Symbolism of Architectural Form*, Revised edition (Cambridge, Mass.: The MIT Press, 1977); Magali Sarfatti Larson, *The Rise of Professionalism: A Sociological Analysis* (Berkeley: University of California Press, 1977); Magali Sarfatti Larson, *Behind the Postmodern Facade: Architectural Change in Late Twentieth-Century America* (Berkeley: University of California Press, 1993).

⁵ Thomas M. Nichols, *The Death of Expertise: The Campaign Against Established Knowledge and Why It Matters* (New York, NY: Oxford University Press, 2017).

⁶ Antoine Picon, *Digital Culture in Architecture: An Introduction for the Design Professions*, 1st Edition. edition (Basel: Birkhäuser Architecture, 2010); Phillip Bernstein and Peggy Deamer, eds., *Building (in) the Future: Recasting Labor in Architecture*, 1 edition (New Haven; New York: Princeton Architectural Press, 2010); Randy Deutsch, *Convergence: The Redesign of Design*, 1 edition (Chichester, West Sussex, United Kingdom: Wiley, 2017); Randy Deutsch, *Superusers: Design Technology Specialists and the Future of Practice*, 1 edition (London; New York: Routledge, 2019).

⁷ On the global distribution of architectural expertise, see Paolo Tombesi, "The Carriage in the Needle: Building Design and Flexible Specialization Systems," *Journal of Architectural Education* (1984-) 52, no. 3 (1999): 134–42; Paolo Tombesi, "A True South for Design? The New International Division of Labour in Architecture," *Arq: Architectural Research Quarterly* 5, no. 2 (June 2001): 171–80; Dave Bharat et al., "Digital Outsourcing in Architecture: Sifting through Promises, Problems and Myths," in *Proceedings of INCITE/ITCSED 2006, IT Solutions of the Design & Management of Infrastructure Construction Projects* (New Delhi: Construction Industry Development Council & Glasgow Caledonian University, 2006), 257–70; Peter Scriver, Paolo Tombesi, and Blair Gardiner, "Upstairs/Downstairs: India, Australia and the Changing Division of Labour in 'offshore' Architectural Production and Education," *Proceedings of AASA*, 2007, 1–6.

⁸ "Canberra Secretariat: Home - Home," June 30, 2019,

<https://web.archive.org/web/20190630004910/http://www.canberraaccord.org/home.aspx>.

⁹ On post-professionalism, see Hossein Sadri, ed., *Neo-Liberalism and the Architecture of the Post Professional Era* (New York: Springer, 2019). Francis Duffy and Andrew Rabeneck, "Professionalism and Architects in the 21st Century," *Building Research & Information* 41, no. 1 (February 1, 2013): 115–22.

¹⁰ On the control of artisanal knowledge in the pre-modern period, see Pamela O. Long, *Openness, Secrecy, Authorship: Technical Arts and the Culture of Knowledge from Antiquity to the Renaissance* (Baltimore: Johns Hopkins University Press, 2001). On architectural expertise before the modern period, see the early chapters of Spiro Kostof, ed., *The Architect: Chapters in the History of the Profession* (Berkeley and Los Angeles: University of California Press, 1977).

¹¹ W. J. Rorabaugh, *The Craft Apprentice: From Franklin to the Machine Age in America* (New York: Oxford University Press, 1986), 33.

¹² Daniel D. Reiff, *Houses from Books: The Influence of Treatises, Pattern Books, and Catalogs in American Architecture, 1738-1950*, 1 edition (University Park, Pa: Penn State University Press, 2000).

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¹⁴ Mary N. Woods, *From Craft to Profession: The Practice of Architecture in Nineteenth-Century America* (Berkeley: University of California Press, 1999); Gwendolyn Wright, *Moralism and the Model Home: Domestic Architecture and Cultural Conflict in Chicago, 1873-1913* (Chicago: University of Chicago Press, 1980). See also Henry Hodgman Saylor, *The A.I.A.'s First Hundred Years*. (Washington: Octagon, 1957); Sibel Bozdogan Dostoglu, "Towards Professional Legitimacy and Power: An Inquiry into the Struggle, Achievements and Dilemmas of the Architectural Profession Through an Analysis of Chicago, 1871-1909" (University of Pennsylvania, 1982); Richard Michael Levy, "The Professionalization of American Architects and Civil Engineers, 1865-1917" (Ph.D., University of California, Berkeley, 1980); Andrew Saint, *Architect and Engineer: A Study in Sibling Rivalry*, First Edition (New Haven; London: Yale University Press, 2008).

¹⁵ Burton J. Bledstein, *The Culture of Professionalism: The Middle Class and the Development of Higher Education in America* (New York: Norton, 1976); Thomas L. Haskell, *The Emergence of Professional Social Science: The American Social Science Association and the Nineteenth Century Crisis of Authority* (Urbana: University of Illinois Press, 1977); Thomas L. Haskell, *The Authority of Experts: Studies in History and Theory*, Interdisciplinary Studies in History. (Bloomington: Indiana University Press, 1984); Samuel Haber, *The Quest for Authority and Honor in the American Professions, 1750-1900* (Chicago: University of Chicago Press, 1991). The idea of professionalism as a constellation of characteristics taken from the study of Marx, Weber, and Durkheim is addressed in Robert W. Habenstein, "Critique of 'Profession' as a Sociological Category*," *The Sociological Quarterly* 4, no. 4 (1963): 291–99. On the "Golden Age" of the sociology of professions, see Elizabeth H. Gorman and Rebecca L. Sandefur, "'Golden Age': Quiescence, and Revival: How the Sociology of Professions Became the Study of Knowledge-Based Work," *Work and Occupations* 38, no. 3 (August 2011): 275–302.

¹⁶ For an authoritative summary of the study of professionalism, see Andrew Abbott, *The System of Professions: An Essay on the Division of Expert Labor* (Chicago: University of Chicago Press, 1988).

¹⁷ The notion of a "professional project" comes from Larson, *The Rise of Professionalism*. The title "professional-managerial class" comes from Barbara Ehrenreich and John Ehrenreich, "The Professional-Managerial Class," in *Between Labor and Capital*, ed. Pat Walker (Boston: South End Press, 1979), 5–45.

¹⁸ Harold L. Wilensky, "The Professionalization of Everyone?," *American Journal of Sociology* 70, no. 2 (1964): 137–58.

¹⁹ David Sciulli, "Professions before Professionalism," *European Journal of Sociology / Archives Européennes de Sociologie / Europäisches Archiv Für Soziologie* 48, no. 1 (2007): 121–47; Jeffrey Halley and David Sciulli, "Professions and Burgertum: Etymological Ships Passing, Night into Day," *Comparative Sociology* 8, no. 2 (January 1, 2009): 202–46. On the complicated usage of the term "professione" by Italian Renaissance architects, see Elizabeth Merrill, "The Professione Di Architetto in Renaissance Italy," *Journal of the Society of Architectural Historians* 76, no. 1 (March 1, 2017): 13–35. For a recently published example of an architectural history that follows this recommended shift from professionalism to expertise, see Peter H Christensen, ed., *Expertise and Architecture in the Modern Islamic World: A Critical Anthology* (Bristol, UK / Chicago, USA: Intellect, 2018).

²⁰ Robert Gutman, *Architectural Practice: A Critical View*, 5th ed. edition (New York, N.Y: Princeton Architectural Press, 1997); Dana Cuff, *Architecture: The Story of Practice*, Reprint edition (Cambridge, MA.: The MIT Press, 1992); Dana Cuff, "The Optional Academy," *Journal of Architectural Education* 40, no. 2 (January 1, 1987): 13–14; Judith R. Blau, *Architects and Firms: A Sociological Perspective on Architectural Practices* (Cambridge, Mass.: MIT Press, 1987); Larson, *Behind the Postmodern Facade*.

²¹ Cuff, *Architecture*; Albená Yaneva, *Made by the Office for Metropolitan Architecture: An Ethnography of Design* (Rotterdam: 010 publishers, 2009).

²² K. Anders Ericsson, ed., *The Cambridge Handbook of Expertise and Expert Performance* (Cambridge: Cambridge University Press, 2006).

²³ Stuart E. Dreyfus and Hubert Dreyfus, "A Five-Stage Model of the Mental Activities Involved in Directed Skill Acquisition" (Operations Research Center: Berkeley, California: University of California, Berkeley, February 1980); Hubert Dreyfus and Stuart Dreyfus, *Mind Over Machine: The Power of Human Intuition and Expertise in the Era of the Computer* (New York: Free Press, 1986).

²⁴ Anders Ericsson and Robert Pool, *Peak: Secrets from the New Science of Expertise*, Reprint edition (Eamon Dolan/Mariner Books, 2017). On the popularization of Ericsson's research, see Malcolm Gladwell, *The Tipping Point: How Little Things Can Make a Big Difference*, 1st ed. (Boston: Little, Brown, 2000).

²⁵ Nigel Cross, *Designerly Ways of Knowing*, 1 edition (Basel: Birkhäuser Architecture, 2003). Omer Akin, "Expertise of the Architect," in *Expert Systems for Engineering Design*, ed. M. Rychener (New York: Academic Press, 1988), 173–96.

²⁶ "Mission – ANFA | Academy of Neuroscience for Architecture," June 30, 2019, <https://web.archive.org/web/20190630164531/http://anfarch.org/board-of-directors/mission/>; John P. Eberhard, "Applying Neuroscience to Architecture," *Neuron* 62, no. 6 (June 25, 2009): 753–56.

²⁷ Harry Francis Mallgrave, *The Architect's Brain: Neuroscience, Creativity, and Architecture*, 1 edition (Chichester, West Sussex, U.K. ; Malden, MA: Wiley-Blackwell, 2009); Harry Francis Mallgrave, *From Object to Experience: The New Culture of Architectural Design* (New York: Bloomsbury Visual Arts, 2018); Harry F. Mallgrave et al., *Mind in Architecture: Neuroscience, Embodiment, and the Future of Design*, ed. Sarah Robinson and Juhani Pallasmaa, Reprint edition (Cambridge, Massachusetts: The MIT Press, 2017). On mid-century personality studies of architects, see Pierluigi Serraino, *The Creative Architect: Inside the Great Midcentury Personality Study* (New York: The Monacelli Press, 2016).

²⁸ H.M. Collins and Robert Evans, "The Third Wave of Science Studies: Studies of Expertise and Experience," *Social Studies of Science* 32, no. 2 (April 1, 2002): 235–96; Harry Collins and Robert Evans, *Rethinking Expertise* (Chicago: University of Chicago Press, 2009). For a critique of the three-wave model, see Sheila Jasanoff, "Breaking the Waves in Science Studies: Comment on H.M. Collins and Robert Evans, 'The Third Wave of Science Studies,'" *Social Studies of Science* 33, no. 3 (2003): 389–400.

²⁹ Steven Shapin is for many the preeminent historian of scientific credibility. See Steven Shapin and Simon Schaffer, *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life* (Princeton, N.J.: Princeton University Press, 1985); Steven Shapin, *A Social History of Truth: Civility and Science in Seventeenth-Century England* (Chicago: University of Chicago Press, 1994).

³⁰ See the early Foucault, such as *The Order of Things: An Archaeology of the Human Sciences* (New York: Vintage Books, 1994). Also, Pierre Bourdieu, *Distinction: A Social Critique of the Judgement of Taste*, trans. Richard Nice (Cambridge, Mass: Harvard University Press, 1984).

³¹ The literature on these approaches is large, I will only include a representative selection of sources. See Michael E Gorman, *Trading Zones and Interactional Expertise: Creating New Kinds of Collaboration* (Cambridge, Mass.: MIT Press, 2010); Peter Galison, "Trading with the Enemy," in *Trading Zones and Interactional Expertise: Creating New Kinds of Collaboration*, ed. Michael E Gorman (Cambridge, Mass.: MIT Press, 2010), 25–52; Steven Epstein, "The Construction of Lay Expertise: AIDS Activism and the Forging of Credibility in the Reform of Clinical Trials," *Science, Technology, & Human Values* 20, no. 4 (1995): 408–37; Theodore M. Porter, *Trust in Numbers: The Pursuit of Objectivity in Science and Public Life*, Reprint edition (Princeton, N.J.: Princeton University Press, 1996); Gil Eyal, "For a Sociology of Expertise: The Social Origins of the Autism Epidemic," *American Journal of Sociology* 118, no. 4 (2013): 863–907. On bodily or sensorial training regimens, see Dominic Boyer, "The Corporeality of Expertise," *Ethnos* 70, no. 2 (June 1, 2005): 243–66; Dominic Boyer, "Thinking through the Anthropology of Experts," *Anthropology in Action* 15, no. 2 (June 1, 2008): 38–46. This subtopic has returned researchers to the question of craft knowledge and tacit knowledge. See Richard Sennett, *The Craftsman*, First Edition (New Haven: Yale University Press, 2009); H. M. Collins, *Tacit and Explicit Knowledge* (Chicago ; London: The University of Chicago Press, 2010).

³² Lorraine Daston and Peter Galison, "The Image of Objectivity," *Representations*, no. 40 (1992): 81–128; Lorraine Daston and Peter Galison, *Objectivity* (New York; Cambridge, Mass.: Zone Books ; Distributed by the MIT Press, 2007); Peter Galison, "Judgment against Objectivity," in *Picturing Science, Producing Art*, ed. Peter Galison and Caroline A. Jones (New York, NY: Routledge, 1998), 327–59; Peter Galison and Lorraine Daston, "Scientific Coordination as Ethos and Epistemology," in *Instruments in Art and Science: On the Architectonics of Cultural Boundaries in the 17th Century*, ed. Ludger Schwarte and Jan Lazardzig (Berlin; New York: Walter de Gruyter, 2008); Peter Galison, "The Journalist, the Scientist, and Objectivity," in *Objectivity in Science: New Perspectives from Science and Technology Studies*, Boston Studies in the Philosophy and History of Science, Volume 310 (Cham, Switzerland ; New York: Springer, 2015), 57–75.

³³ The most recent and comprehensive account of architecture schools in North America is Joan Ockman, ed., *Architecture School: Three Centuries of Educating Architects in North America*, 1st edition (Cambridge, Mass. : Washington, D.C: The MIT Press, 2012).

³⁴ J. A. Chewning, "William Robert Ware and the Beginnings of Architectural Education in the United States, 1861-1881" (Massachusetts Institute of Technology, 1986); J. A. Chewning, "William Robert Ware at MIT and Columbia," *JAE* 33, no. 2 (1979): 25–29.

³⁵ Stephen Parcell, *Four Historical Definitions of Architecture* (Montreal: McGill-Queen's University Press, 2012).

Introduction to Part I: The 1870 Drawing Act

On May 16, 1870, the Massachusetts state legislature passed “An Act Related to the Free Instruction in Drawing.” The act stated that “Any city or town may, and every city or town having more than 10,000 inhabitants shall, annually make provisions for giving free instruction in industrial or mechanical drawing to persons over fifteen years of age, either in day or evening schools, under the direction of the school committee.”¹ Never before had a state of the Union mandated the widespread introduction of drawing education into its school system. Although the popularity of drawing books had increased in the antebellum period, most mid-nineteenth-century Americans, especially those who celebrated the nation’s reputation for practicality, still associated drawing either with the work of artists or the recreational pastimes of polite women. Now, without the direction of an official state education policy, all but the smallest communities in Massachusetts would need to determine how to create and implement drawing programs for their local schools.²

To do so, many local school board members and community leaders followed the direction of a group of drawing experts that assembled in and around Boston. The group would be led by Walter Smith (FIGURE 2), a 35-year-old Englishman who the Superintendent of Schools in Boston and the Standing Committee on Drawing recruited from the Leeds School of Art to direct Massachusetts’s new drawing curriculum. Smith had studied under Robert Redgrave in the South Kensington system of art education, which the indefatigable Victorian art administrator Henry Cole had begun to construct in the 1850s. At Leeds, Smith’s “Mechanical and Architectural Class” quickly became popular among the local artisans and convinced him of the validity and potential of drawing education.³ Sometime soon after Smith arrived in Massachusetts in May of 1871, he met Ware, who was then in the process of opening MIT’s school of architecture. It is the relationship between this growing concern for drawing education and architecture as an advanced form of visual literacy that is the principal concern of this section.

The adjectives “industrial” and “mechanical” in the 1870 Drawing Act were essential, although somewhat ambiguous, qualifiers in the legislation. Like “art” and “culture,” they were words then undergoing rapid transformation.⁴ When applied to the act of drawing, industrial and mechanical suggested a mode of representation that prioritized linearity over tonal value and accurate description over artistic expression--in other words, a shift away from the pictographic and recreational assumptions of the antebellum period. In instructional texts like Smith *The American Text Books for Art Education* (1873; FIGURES 3 AND 4) that followed the passage of the Act, Smith recommended that school administrators at the primary school, grammar school, high school, and normal school levels devote two hours per week in their schedules for drawing instruction. In these classes, supposing that the instructor followed Smith’s course of study, students would learn to draft by first learning the rudiments of geometry and by drawing to scale and in

orthographic projection. At the elementary level, students learned “from the flat,” by copying other drawings. As students advanced, they began to draw from objects, such as everyday houseware, decorative fragments, or parts of machines, and they learned to work free-hand. Only at the most advanced stage, at which point industrial or mechanical drafting shaded into art and architectural drawing, students practiced original design and considered the interior or surface quality of objects that they had initially described exclusively in outline. In general, “industrial” and “mechanical” suggested an object-oriented drawing practice, but as administrators of the new art education tried to translate these values into a systematic curriculum, it was never completely clear if, when, or how drawing ceased to be technical and became something more. Suffice it to say that the lobbyists behind this legislation did not intend to create a generation of artists, even if the legislation itself served as the basis or founding myth for the development of art education in the United States.⁵

The 1870 Drawing Act was, first and foremost, an economic intervention. The people of Massachusetts were not clamoring in the years following the end of the Civil War for drawing education, although teaching materials appropriate for common schools did exist. William B. Fowle’s *The Eye and the Hand* series, for example, was published in Boston in 1849.⁶ Instead, drawing education was an initiative led by self-proclaimed “enlightened industrialists.” Joseph White, the Secretary of the Massachusetts Board of Education, described the lobbyists behind the innovative legislation as “well known and highly respected citizens, distinguished for their interest in popular education, and for their connection with those great branches of mechanical and manufacturing industry which absorb large amounts of capital, and give employment to great numbers of the residents of the Commonwealth.”⁷ The lobbyists were motivated by concerns for diminishing profits in manufacturing, which they attributed to the low design quality and craftsmanship of American goods relative to French, German, and English alternatives. World exhibitions, those ritual celebrations of modernity and progress, starkly revealed America’s relative backwardness in manufacturing, but the rapid ascent of English luxury goods in the 1850s and 1860s also suggested a way forward. “At the Universal Exhibition in 1851,” Ware explained to the Massachusetts State Board of Education, under Joseph Paxton’s cast-iron and plate-glass Crystal Palace,

England found herself, by general consent, almost at the bottom of the list, among all the countries of the world, in respect of her art manufacturers. Only in the United States, among the great nations, stood below her. The first result of this discovery was the establishment of Schools of Art in every large town. At the Paris Exhibition of 1867, England stood among the foremost, and in some branches of manufacture distanced the most artistic nations. It was the Schools of Art and the great collections of works of Industrial Art at the South Kensington Museum that accomplished this result. The United States still held her place at the foot of the column.⁸

The success of the English art educators gave the reformers in Massachusetts confidence that they too could turn their state’s public school system, which by the 1870s had become the most advanced, well-financed educational bureaucracy in the

nation, toward vocational ends.⁹ What's more, the success of the English convinced the advocates of the Drawing Act that technical skill was something that could be legislated into existence via the disciplinary apparatus of the school. Hitherto, the import tariff was the only means of regulating the position of American-made goods in the international marketplace. Drawing education signaled a more active approach to economic regulation.¹⁰

As an economic intervention, then, the 1870 Drawing Act had several objectives. In the absence of a robust apprenticeship system, the first and most general objective was to use drawing pedagogy as a formal technique of enskilment.¹¹ Mechanical drafting would serve as a universal "language of industry," a "grammar of the machine," that linked the different subsectors of the manufacturing community together and improved communication between management and a growing number of machine operators, or "operatives," in factories.¹² Mediating the relationship between management and factory labor was the figure of the draftsmen, a skilled worker whose drawings would help to eliminate waste and promote innovation in the production process. Earlier in the century, New England manufacturers recruited European draftsmen to fulfill this role, but soon the recruitment of foreign individuals lagged behind industrial expansion. A second objective, then, was to decrease the state's dependence on European-trained draftsmen by producing American replacements. A third objective was to elevate the taste of the public. Even if drawing students never became draftsmen or factory workers, advocates of the Drawing Act knew that they would someday become consumers. A fourth objective, which contemporary scholars still debate, was to promote social mobility among workers. Drawing education was certainly an economic intervention, but if in skilling workers through drawing enabled them to secure better employment and higher wages, one could at least make the argument that the 1870 Drawing Act was a "democratic maneuver."¹³

Whatever its objectives might have been, the 1870 Drawing Act ushered Massachusetts into a period of concerted pedagogical experimentation. New theories of seeing, new techniques of drafting, and new institutional arrangements--including equipment like blackboards, chalk, pencils, paper, models, rulers, drawing pens, drawing boards, T-squares, compasses, and other mathematical instrumentation necessary to produce measured drawings (none of which the average common school normally possessed)--facilitated the spread of drawing education throughout the state, both disrupting and reifying long-standing social and epistemological hierarchies related to learning and work. By the middle of the 1870s, however, the moment began to subside. The Panic of 1873 sapped enthusiasm across the country for "useful knowledge" campaigns.¹⁴ The same manufacturers who had invested so heavily in drawing education lost conviction in the idea that drawing taught in schools could provide an industrial panacea or a means to avoid labor conflict. Drawing education persisted, but with neither the same funding nor the same sociopolitical charge as it had in the early 1870s. By the turn of the century, despite the growing impact of manual and vocational training in schools, most progressive educators no longer considered drawing a universal means of technical enskilment. Instead, they became interested in drawing as a mode of creative expression, an avenue to the fine arts.¹⁵

Architectural historians have not previously assessed Ware's involvement in the 1870 Drawing Act or the impact of this legislation on architectural education, but Ware's active support of the Act and his direct involvement with its implementation reveals much about the emergence of architectural expertise in this critical moment in the history of the profession, from roughly 1866 until the Centennial Exhibition of 1876 in Philadelphia, when European schemes for manual education were introduced with great fanfare to the American public. These ten years were crucial because within them, architects found a compelling reason for including their discipline in the movement for education reform.

Historiographical biases help to explain why this episode has not received attention from those concerned with the history and development of architectural education. First, many historians of the architecture profession, like historians of other professional groups, have assumed that the school is a secondary (reactive) rather than a primary (active) institution. Architectural education, following this basic sociological assumption, responds to large-scale social forces that affect the so-called real world of professional practice; it does not cause or, at the least, contribute to these forces in the very first instance. This assumption is dubious today as the educational sector continues to grow in size and influence. The historical case study that follows suggests that the reactive fallacy may also distort our understanding of the past.¹⁶

Another historiographical bias that has helped to obscure the impact of forces related to the 1870 Drawing Act on architecture is the tendency of architectural historians to rely on professional journals to understand the development of the architecture profession. These journals are vitally important documents, but the fact is that the American architectural press was not firmly established in the late 1860s and early 1870s, and could not, for this reason, serve as a forum for architects—such as they existed—to consider the implications of widespread drawing education on their professional standing. Boston's the *American Architect and Building News*, for example, with which Ware was closely associated, began to publish in 1876, after much of the excitement for drawing education in Massachusetts had already begun to subside.¹⁷ Had the *American Architect and Building News* existed earlier in the decade, Ware almost certainly would have used this journal to publicize his support for public drawing education to other architects, given that he never hesitated to take advantage of his publishing connections to further his academic and professional enterprises at other points in his career.

In the following two chapters, I focus on how Ware established credibility as a cultural advisor. He broadened the relevance of architecture by emphasizing that it was not merely an act of building but was fundamentally connected to the more general issue of skill. Ware used the Drawing Act as a public platform to defend the intellectual legitimacy of architecture as a mode of visual thinking. The secure establishment of demand for his expert advice afforded an opportunity for Ware to isolate the specific character of architectural expertise and to embed it within an institutional framework that facilitated its further development.

The 1870 Drawing Act also gives contemporary scholars an opportunity to reconsider Ware's role as the so-called founder of the collegiate system of architectural education in the United States. What I want to suggest here, following the work of Schaffer, Biagioli, Collins, and other researchers in the field of science and technology studies, is that Ware functioned as a go-between, broker, or translator who helped to link together the professional, academic, and public realms. Ware was not a polemicist; he did not see himself as part of any pedagogical or intellectual battles.¹⁸ At the beginning of the postbellum period, drawing constituted what Galison has referred to as a "trading zone" in which the reciprocal exchange of ideas and techniques occurred between a diverse set of actors, sometimes resulting in new forms of "interactional expertise."¹⁹ Ware has been widely regarded as the first professor of architecture in America, but for these reasons it is just as important to remember the impressive social and cultural divides that he bridged as a Professor of Drawing at the Massachusetts State Normal Art School and as a member of the managing committee of the School of Drawing and Painting at Boston's Museum of Fine Arts. American architecture's position in the latter half of the nineteenth century between technology, closely related to the useful arts, and the fine arts was very much a position that Ware personally constructed throughout the early half of his career.²⁰

Ware may not have been an especially original designer or philosophical thinker, but close analysis of his involvement in the 1870 Drawing Act demonstrates that he was politically shrewd and understood how to successfully mobilize the rhetoric of drawing to further different objectives, including the specific objective of institutionalizing architectural education. This political acumen and rhetorical sensitivity helped him to communicate with Boston's Brahmin establishment, which dominated the upper-echelon of cultural life in Massachusetts, including Harvard, and with the state's ascendant industrial class, some of whom patronized MIT, two competing communities that he would rely upon to support the development of architectural practice in America. My reading of Ware's involvement with drawing reform thus tries to highlight the different ways that he borrowed from other drawing experts like Smith in order to strengthen his position in relation to the discipline's patrons. Crucially, Ware understood better than many other American architects that to achieve disciplinary status and to enter the confines of the university, architecture needed to become a *public* resource, one that responded to pressing social concerns other than and in addition to the perennial Vitruvian demand for beautiful, durable, and functional buildings.

Ware, in short, helped to make the discipline of architecture a matter of public concern by linking it, through drawing, with education reform. Unlike the construction-oriented theory of architectural education that emerged from Leopold Eidlitz's unsuccessful 1867 proposal for an AIA-administered Grand Central School of Architecture, which Kate Holliday has succinctly paraphrased as "build more and draw less," Ware quickly identified that drawing, a term that in the 1870s was as ambiguous and polyvalent as "industrial" or "mechanical," had suddenly become central to the ideology of American industrialism.²¹ By stepping forward as an expert in draftsmanship writ large, and not just as an importer of the *École des Beaux Arts* theory of design, Ware expanded the cultural meaning of architectural expertise beyond a mere knowledge of construction or

aesthetic style. Indeed, the argument put forth here is that a decisive dimension to his support of the 1870 Drawing Act was the implication that drawing education, especially as it progressed toward architectural drawing as a pedagogical ideal, was a means of developing a visual mode of thought that educational institutions in the United States had rarely, if ever, acknowledge in the past. This mode of “visual thinking,” as Rudolf Arnheim would call it nearly a century later, was figural rather than conceptual, nonverbal rather than literary, and for Ware the public appreciation of it was a necessary condition for the long-term success of American architecture and other technologically-oriented fields of study.²² At least in Massachusetts, it became possible for a broad base of educators to consider architecture an academic discipline as soon as visual thinking became intellectually legitimate, and visual thinking became intellectually legitimate in relation to the discourse of drawing promulgated by the campaigns and events surrounding the 1870 Drawing Act.

Part I consists of two chapters. In Chapter One, “Building Credibility, or How Ware Became an Expert Advisor,” I describe how Ware’s relationship with MIT and Harvard helped to establish his credibility as an advisor on an unusual cultural policy like drawing education. In this section, Ware’s expert identity emerges as a representative of a new kind of technologically oriented academic institution and as a professional who tried to differentiate himself from Boston’s cultural elite. In Chapter Two, “In the ‘Eye of the Mind’: Drawing as Enskilment and as Visual Thought,” I describe the industrial desire for drawing education, which was to produce skilled laborers and construct a culture of control, and how Ware and Walter Smith rhetorically turned this desire toward the public recognition of drawing as a cognitive activity, a kind of Albertian move that elevated the status of architecture as an academic discipline.²³ It was the imagination, which in the discourse of the 1870 Drawing Act sometimes appeared as the metaphor of the “eye of the mind,” which provided a portal through which American architecture, affiliated with the useful arts throughout the antebellum period, entered the realm of the liberal arts.

Endnotes to Part I Introduction

¹ Massachusetts Board of Education, "Thirty-Fourth Annual Report of the Board of Education, Together with the Thirty-Fourth Annual Report of the Secretary of the Board (1870)" (Boston, 1871).

² My analysis in Part I is indebted to the work of a number of different historians of art education, including the following: Mary Ann Stankiewicz, *Developing Visual Arts Education in the United States: Massachusetts Normal Art School and the Normalization of Creativity*, 2016; Donald Soucy and Mary Ann Stankiewicz, eds., *Framing the Past Essays on Art Education*. (Reston, Va: National Art Education Association, 1990); Arthur Efland, *A History of Art Education: Intellectual and Social Currents in Teaching the Visual Arts* (New York: Teachers College Press, 1990); Stuart Macdonald, *The History and Philosophy of Art Education* (London: University of London P, 1970).

³ Harry Green, "Walter Smith: The Forgotten Man," *Art Education* 19, no. 1 (1966): 3–9.

⁴ Raymond Williams, *Culture and Society, 1780-1950* (New York: Columbia University Press, 1983).

⁵ Efland, *A History of Art Education*; Walter Smith, *Art Education, Scholastic and Industrial* (Boston: J.R. Osgood and Company, 1872); Walter Smith, *American Text Books of Art Education: Geometrical Drawing* (Boston: James R. Osgood & Co., 1873).

⁶ William Bentley Fowle, *The Eye and Hand; Being a Series of Practical Lessons in Drawing, for the Training of Those Important Organs; Adapted to the Use of Common Schools*, ed. Louis Benjamin Franceour (Boston: W.B. Fowle, 1849).

⁷ Massachusetts Board of Education, "Thirty-Fourth Annual Report of the Board of Education, Together with the Thirty-Fourth Annual Report of the Secretary of the Board (1870)," 163.

⁸ William R. Ware, "Mr. Ware's Letter," in *Thirty-Fourth Annual Report of the Board of Education, Together with the Thirty-Fourth Annual Report of the Secretary of the Board (1870)* (Boston, 1870), 185. On economic backwardness in the nineteenth century, see Alexander Gerschenkron, *Economic Backwardness in Historical Perspective: A Book of Essays* (Cambridge: Belknap Press of Harvard University Press, 1962). For overviews of art academies, including drawing programs, in Europe, see Nikolaus Pevsner, *Academies of Art, Past and Present* (New York: Da Capo Press, 1973); Ann Bermingham, *Learning to Draw: Studies in the Cultural History of a Polite and Useful Art* (New Haven, CT: Published for the Paul Mellon Centre for Studies in British Art by Yale University Press, 2000). Chewning suggests that Bostonians were concerned with the rise of New York as the national distribution center of American manufacturing in "William Robert Ware and the Beginnings of Architectural Education in the United States, 1861-1881" (Massachusetts Institute of Technology, 1986).

⁹ Michael B Katz, *The Irony of Early School Reform: Educational Innovation in Mid-Nineteenth Century Massachusetts* (New York: Teachers College Press, 2001); Michael B Katz, *Reconstructing American Education* (Cambridge, Mass.: Harvard University Press, 1987); Marvin Lazerson, *Origins of the Urban School; Public Education in Massachusetts, 1870-1915*. (Cambridge: Harvard University Press, 1971).

¹⁰ The biopolitical notion of the school as a disciplinary apparatus, one that produces individual economic features like skill, comes from Michel Foucault, *Discipline and punish: the birth of the prison* (New York: Vintage Books, 1995). On the role of skilled workers in the New England economy during the nineteenth century, see Peter Temin, *Engines of Enterprise: An Economic History of New England* (Cambridge, Mass.: Harvard University Press, 2000).

¹¹ The term "enskilment," sometimes spell "enskillment" comes from the anthropological discourse on situated learning and thinking. Tim Ingold, for example, uses it frequently in his work on line making. See Timothy Ingold, "Beyond Art and Technology: The Anthropology of Skill," in *Anthropological Perspectives on Technology*, ed. M.B. Schiffer (Albuquerque: University of New Mexico Press, 2001), 17–31; Tim Ingold, "The Social Child," in *Human Development in the Twenty-First Century: Visionary Ideas from Systems Scientists*, ed. Alan Fogel, Barbara J King, and Stuart Shanker (Cambridge; New York: Cambridge University Press, 2008). See also Jean Lave and Etienne Wenger, *Situated Learning: Legitimate Peripheral Participation* (Cambridge [England]; New York: Cambridge University Press, 1991); John Seely Brown, Allan Collins, and Paul Duguid, "Situated Cognition and the Culture of Learning," *Educational Researcher* 18, no. 1 (1989): 32–42; Cristina Grasseni, Cristina Grasseni, and Society for the Anthropology of Europe (U.S.), *Developing Skill, Developing Vision: Practices of Locality at the Foot of the Alps* (New York: Berghahn Books, 2009).

¹² The phrase “language of industry” comes from Molly Nesbit, “The Language of Industry,” in *The Definitively Unfinished Marcel Duchamp*, ed. Thierry de Duve (Halifax, N.S.; Cambridge, Mass.: Nova Scotia College of Art and Design ; MIT Press, 1991), 351–94. See also David Brett, “Drawing and the Ideology of Industrialization,” *Design Issues* 3, no. 2 (1986): 59–72. The phrase “grammar of the machine” comes from Edward Stevens, *The Grammar of the Machine: Technical Literacy and Early Industrial Expansion in the United States* (New Haven: Yale University Press, 1995).

¹³ Paul E. Bolin, “The Massachusetts Drawing Act of 1870: Industrial Mandate or Democratic Maneuver?,” in *Framing the Past Essays on Art Education.*, ed. Donald Soucy and Mary Ann Stankiewicz (Reston, Va: National Art Education Association, 1990), 59–68; Paul E. Bolin, “Bordering the Familiar: Drawing Education Legislation in the Northeastern United States, 1871-1876,” *Studies in Art Education* 45, no. 2 (2004): 101–16.

¹⁴ Roger Geiger, a historian of the education in the United States, writes, “The post-Civil War explosion of utilitarian forms of education exhausted its expansive force by the mid-1870s. The panic of 1873 ended the postwar economic boom and dampened the mood of the country. These changes were particularly apparent in agriculture, where falling prices and related worries engendered a powerful movement concerned with the plight of the farmer.” Roger L Geiger, *The American College in the Nineteenth Century* (Nashville: Vanderbilt University Press, 2000), 166.

¹⁵ Stankiewicz, *Developing Visual Arts Education in the United States*.

¹⁶ David Baker, *The Schooled Society: The Educational Transformation of Global Culture* (Stanford, Calif.: Stanford University Press, 2014).

¹⁷ Mary Woods, “The First American Architectural Journals: The Profession’s Voice,” *Journal of the Society of Architectural Historians* 48, no. 2 (1989): 117–38.

¹⁸ Michael Lewis, “The Battle between Polytechnic and Beaux-Arts in the American University,” in *Architecture School: Three Centuries of Educating Architects in North America*, ed. Joan Ockman, 1st edition (Cambridge, Mass. : Washington, D.C: The MIT Press, 2012), 67–89.

¹⁹ Peter Galison, “Trading with the Enemy,” in *Trading Zones and Interactional Expertise: Creating New Kinds of Collaboration*, ed. Michael E Gorman (Cambridge, Mass.: MIT Press, 2010), 25–52; H.M. Collins and Robert Evans, “The Third Wave of Science Studies: Studies of Expertise and Experience,” *Social Studies of Science* 32, no. 2 (April 1, 2002): 235–96; Mario Biagioli, *Galileo, Courtier: The Practice of Science in the Culture of Absolutism* (Chicago: University of Chicago Press, 1993); Mario Biagioli, “Galileo’s System of Patronage,” *History of Science* 28, no. 1 (1990): 1–62.

²⁰ Simon Schaffer, *The Brokered World: Go-Betweens and Global Intelligence, 1770-1820* (Sagamore Beach, MA: Science History Publications, 2009). On the growth of cultural hierarchy in nineteenth-century Boston, see Paul Dimaggio, “Cultural Entrepreneurship in Nineteenth-Century Boston: The Creation of an Organizational Base for High Culture in America,” *Media, Culture & Society* 4, no. 1 (January 1, 1982): 33–50; Paul Dimaggio, “Cultural Entrepreneurship in Nineteenth-Century Boston, Part II: The Classification and Framing of American Art,” *Media, Culture & Society* 4, no. 4 (October 1, 1982): 303–22.

²¹ Kate Holliday, “‘Build More and Draw Less’: The AIA and Leopold Eidlitz’s Grand Central School of Architecture,” *Journal of the Society of Architectural Historians* 65, no. 3 (2006): 378–401. Holliday’s description of Eidlitz is predicated on a caricature of Ware as an elitist who adapted architectural education to the university system in order to ensure the patrician establishments control of the profession. Eidlitz, in contrast, was an immigrant who rejected the university on more democratic grounds. “Eidlitz believed a new start, a brand new school that allowed architects to control a curriculum independent of long-standing traditions, was the way to cast off the mistakes of the past” *Leopold Eidlitz: Architecture and Idealism in the Gilded Age* (New York: W.W. Norton & Co., 2008), 87.

²² Rudolf Arnheim, *Visual Thinking* (Berkeley: University of California Press, 1969).

²³ The fifteenth-century Renaissance architect and author Leon Battista Alberti helped to elevate the status of architecture from the mechanical arts to the liberal arts, in part, by associating architectural drawing with the mathematics of geometry and the invention of linear perspective. Drawing, through these associations, became an intellectual activity and the architect more than a builder. See Leopold Ettlinger, “The Emergence of the Italian Architect during the Fifteenth Century,” in *The Architect: Chapters in the History of the Profession*, ed. Spiro Kostof (Berkeley and Los Angeles: University of California Press, 1977), 96–123; David Rosand, “Disegno: The Invention of an Art,” in *Drawing Acts: Studies in Graphic Expression and Representation* (Cambridge, UK; New York: Cambridge University Press, 2002), 24–60.

Chapter One
Professional Self-Fashioning: Building Credibility, Becoming Expert

Prior to the late nineteenth century, when the collegiate system of academic credentialing and the state system of professional licensing were created, anybody could use the title “architect.” The occupational category was unregulated; anyone, in theory, could call himself an architect or claim to possess expertise in the problems and skills associated with the practice. The first licensing law for architecture was not passed until 1897, when Chicago architects successfully petitioned the state of Illinois. And yet nineteenth-century Americans, in most cases if not all, still seemed able to identify those who possessed architectural expertise from those who did not. The process of identification may have been riskier, and the means of separating experts from amateurs may have lacked the clarity of the rule of law, but clearly it was possible. How, then, did experts distinguish themselves before academic credentials and professional licenses became available? The answer to this question lies in how individual practitioners accumulated trust.

In the history of architecture as a profession, the 1860s was the transition point between more traditional, informal practices of becoming socially recognizable as an expert and the modern, organizational system of producing experts. American architects in the 1860s looked forward to the legal regulation of their field, but they continued to distinguish themselves through an older process that I will call “professional self-fashioning.” Stephen Greenblatt introduced the term “self-fashioning” to describe how a “new man” in sixteenth-century England constructed his public persona as a courtier, using conducts books and other tools of self-cultivation to shape his identity into a recognizable social form.¹ Likewise, Steven Shapin has described the cultural practices and “moral technologies” that early modern natural philosophers like Robert Boyle used to make empirical investigations credible, thereby creating the modern subjectivity now known as the scientist.² Architectural historians of the early modern period have taken similar approaches to their peers in early modern literature and the history of science in trying to explain, for example, why Italian Renaissance architects like Alberti used the term “professional” if professionalism, as we know it today, did not exist.³ When we think about how American architects became experts in the 1860s and beforehand, we should likewise consider how this generation might have pursued specific kinds of career paths or projected particular self-images that fit a more or less definite notion of what it meant to be a professional.⁴ The possession of books that could prove the archaeological accuracy of a design; public declarations of faith in the truthfulness of a style like the Gothic; insinuating one’s European breeding through certain kinds of clothing or word choice; sharing the same name as a father with a proven track record: these were some of the sources of credibility that were available in the 1860s. By the end of the 1880s, a diploma from M.I.T. or the University of Illinois or Cornell might suffice to start a career. Through this line of inquiry, we will better understand which aspects of professional self-fashioning became standardized through the collegiate

system of architectural education and state licensure, creating institutional paths to professional recognition that continue to affect the meaning of architectural expertise today.

Of all the American architects working the 1860s, William R. Ware's early career serves as an important case study for understanding the transition from professional self-fashioning to institutional credentialing, given his strong influence on the collegiate system of architectural education. Ware came from a prominent Unitarian family and graduated from Harvard College in 1851 with a Bachelor of Arts degree. Soon thereafter, sometime during the three years before he entered the Lawrence Scientific School to complete post-graduate training in civil engineering, he decided to pursue architecture as his professional calling. His relatively privileged background provided him with untold advantages, but he never received a diploma in architecture, he never studied architecture in the École des Beaux Arts, and he was never celebrated in the architectural press as a remarkable designer. It would have seemed more likely for a prolific designer like Richard Morris Hunt or Henry Hobson Richardson to become the leading educator in American architecture, and yet Ware of all people would come to occupy that role.

Ware's personality is, perhaps counterintuitively, part of the explanation for why he became an early authority in the field of architectural education. Because Ware lacked the confidence of a so-called born artist and was naturally inclined to self-doubt, he was unusually reflective about what the process of professional self-transformation might entail and he openly questioned if it was possible for someone who lacked natural artistry to become an architect. In a letter to an unknown colleague from June of 1854, Ware wrote:

The only profession to which I have ever felt myself attracted is Architecture. I took my fancy as a child and I have always maintained my interest in it. I always, however, considered it quite out of the question that I could pursue it as a profession, and had not the presumption to suppose that I had the ability to succeed in it. It is only after looking in vain for some other congenial employment that I have allowed myself to turn a wistful eye in that direction. My own wishes and the representations of my friends have gone far to persuade me that I had taken a wrong view of the subject. I have thought that it was in fact quite as much a useful as a fine art, and as such offered to any intelligent person a career in which success would be proportionate to his learning and diligence...Yet I cannot escape from the feeling that Architecture is after all an Art and not a science, and that only an artist can succeed in it. In this difficulty I have felt the want of someone from whom I could learn whether my scruples were just, and I have wished you were where I could have the benefit of your counsel...If I succeed in convincing myself that at present day the profession only demands knowledge and good taste, both which will come through conscientious study, I will begin my education as an Architect with alacrity and not much fear for the result...I take it that Architecture forms the connecting link between the useful and the Fine Arts, and that the Artist and the Engineer may alike find it a successful field of labor.⁵

Whether or not Ware ever resolved the question of his own identity as an artist, public demand for expertise in mechanical drawing, which intensified in the late 1860s, accelerated the process of his own professional self-fashioning. The 1870 Drawing Act thrust Ware into a position of authority before he had completed a significant architectural project or turned the architecture program at M.I.T. into a model that architectural educators around country would follow. He was then basically a church architect who alongside his partner, Henry Van Brunt, had won a large design competition for Harvard's Memorial Hall (FIGURE 5), which would not be constructed for another decade. After completing his civil engineering course at Lawrence Scientific School, Ware worked as an architectural draftsman in the Boston office of Edward Clarke Cabot and studied in the New York atelier of Richard Morris Hunt. Both Cabot and Hunt were highly reputed figures in the world of professional architecture, but Ware was still far from being an architect of note. In September of 1865, Ware readily acknowledged this need for publicity in a letter that he sent to Charles Eliot Norton, the head of Memorial Hall's building committee, on behalf of himself and Van Brunt. "If the Committee were ready to pronounce in our favor," Ware wrote,

We should be very glad to get the credit of it. Conjointly, of course, we are eager to be in the mouths of men, and personally I at least am quite sharp set after my share of these plumes—though the share which rightly belongs to me is not very large, at least in the case of this last design. The Institute of Technology having, as you have seen, thrust greatness upon me, I am particularly desirous to achieve a little, both to justify their choice in the eyes of men and to add a spark, if I may, to the lustre of the new school.⁶

Though it was not the project that he might have been hoping for, an opportunity for Ware "to be in the mouths of men" came in December of 1869, when Joseph White, the Secretary of the Massachusetts State Board of Education, circulated a letter to a roster of notable industrialists and art educators asking for their advice about how to administer what would become the 1870 Drawing Act. This was the moment when Ware became involved as an expert and public advocate in the movement for vocational reform through drawing instruction. It was an opportunity to become a "social trustee" and to associate architecture with public well-being.⁷ Secretary White asked the recipients of the letter to provide their opinions on the following six topics:

1. The advantages which might be expected to result from the contemplated instruction in mechanical or industrial drawing.
2. The course and methods of instruction appropriate for the objects in view.
3. The models, casts, patterns and other apparatus necessary to be supplied.
4. The organization and supervision of the proposed Drawing Schools.
5. The best means of promoting among the people an interest in the subject of art education.
6. Any other remarks relating to the subject, not embraced in the foregoing topics.

Secretary White needed to solicit expert counsel on a novel area of governance because technical knowledge in the nineteenth-century America was not centralized within state bureau, as was the case throughout Continental Europe. In France, for example, the leaders of the *École Polytechnic*, the engineering school created after the Revolution in 1794 and directed by the French Ministry of Defense, would have simply determined the state policy on drawing that the rest of the country would then follow. However, in the absence of such a pre-existing body of experts trained and employed by the state, Secretary White used the circular letter—like reports, dossiers, questionnaires, and other “little tools of knowledge” created by government officials and corporate managers—was a way for White to gather information and inform policy.⁸

Why was the letter sent to Ware? Ware’s education represented just about the best training in draftsmanship that an American could have received in the middle of the nineteenth century without studying abroad or enlisting as a cadet at West point. His family background in New England connected him to a strong social network at Harvard, and as a Cabot and Hunt protégé, he was connected to the highest echelons of professional architecture. Nevertheless, these connections would not have made him a public authority. To understand how Ware fashioned himself into a drawing expert and how expertise in drawing supported his career as an architectural educator, we need to understand his affiliation with M.I.T. and how this affiliation brought him into contact with an international retinue of drawing specialists. Ware’s expertise did not derive from his experience as a builder or designer; it derived from his institutional associations, especially with technology and the widespread belief that architecture, understood as a drafting culture, played a crucial role in preventing the disassociation of the useful, liberal, and fine arts.

Drawing Technology Together: Architecture at M.I.T.

M.I.T. was an unusual initiative in the history of American higher education, sharing similarities with mechanics’ institutes like the Franklin Institute in Philadelphia and the polytechnic schools of Europe, but diverging from both institutional models in significant ways. Like the Franklin Institute, one of the early settings of architectural education in the nineteenth century and the most successful outgrowth of George Birkbeck’s “useful knowledge” movement, William Barton Rogers intended for M.I.T. to flatten epistemological distinctions between science and art, pure and applied knowledge. The institution’s motto, for example, was “*Mens et Manus*” (“Mind and Hand”) and its seal showed a muscular artisan with a hammer alongside a berobed professor (FIGURE 6).⁹ Rogers and his faculty refused to accept the long-standing hierarchy between theory and practice, contemplation and manipulation. That mind-body hierarchy ultimately derived from the Aristotelian belief that knowledge from the liberal arts was superior to the knowledge produced by the mechanical arts because one could prove it deductively. Unlike the embodied knowledge of a craftsman, which one could only make manifest in the application of a technique, or the empirical knowledge gleaned from the investigation of natural phenomena, deductive knowledge was easy to replicate in print and generalize to all possible sites of study. Hence, deductive knowledge constituted

disciplines; it was knowledge that masters could transmit across time and place to the disciples. By the antebellum period, however, the rise in the status of the useful knowledge movement displaced the preeminence of deductive knowledge in the United States, leading many to celebrate knowers who possessed both formal knowledge and technique. The ideal knower was the “scientific mechanic.” Many nineteenth-century Americans associated this ideal with the life of Benjamin Franklin, who inspired M.I.T.’s seal.¹⁰

Unlike the devotees of Birkbeck’s movement, however, or even the administrators of a state-run academy like the École Polytechnique in France, Rogers insisted to his supporters that the goal of M.I.T. was neither to provide job training nor to prepare students to join an elite corps of bureaucrats. That would not be appropriate for America’s republican tradition. “The education which we seek to provide, Rogers wrote in his foundational “Objects and Plan” address of 1861, “although eminently practical in its aims, has no affinity with that instruction in mere empirical routine which has sometimes been vaunted as the proper education for the industrial classes. We believe, on the contrary, that the most truly practical education, even in an industrial point of view, is one founded on a thorough knowledge of scientific laws and principles, and which unites with habits of close observation and exact reasoning a large general cultivation.”¹¹ Rogers was wary of placing too much emphasis on the term “industrial” to describe the kind of education that M.I.T. was to provide since that term possessed associations that worked against his liberal interest in “a large general cultivation.” From Joseph Kett’s assessment of vocational training in the middle of the nineteenth century, we know that many American industrial schools were part of a disciplinary apparatus that aimed only “at inculcating simple trade skills and routinized work habits in delinquents, criminals, and paupers in reformatories and workhouses.”¹² Later in the 1860s, New England educators introduced vocational training curricula to black freedmen at the Hampton Agricultural and Industrial School and at the Tuskegee Institute.¹³ To avoid the class and racial connotations surrounding terms like “the industrial arts” or “vocationalism” Rogers invoked the term “technology” to connote a practicality that derived from craft experience but trended in the direction of pure scientific research. According to one historical of this cultural keyword, in the 1860s “*technology* was a field of study, not the object of study”; this meant that the identity of technologists, like applied scientists, was separate from the machines or objects that they studied.¹⁴ In Rogers’s epistemological hierarchy, technologists occupied a position that was above skilled workers but still connected to the needs of an industrial economy.

Without a specific object or method to limit technology as a field of study, Rogers relied on the study of mechanical drafting to delimit the scope of M.I.T.’s curriculum. Every subject that M.I.T. offered in its early years was united with every other subject, at least at a rudimentary pedagogical level, by the drawing studio. The institutional centrality of drawing was why Rogers sought the involvement of an architect like Ware. In Rogers’s “Scope and Plan” of 1864, an elaboration of his “Objects and Plan” address, he described a “General or Popular Department” that M.I.T. would make available for free in the evenings to any member of the public, as well the “Special and Professional

Department” that would require selective admission and a small enrollment fee. The “General or Popular Department” consisted of lectures in mathematics, physics and mechanics, chemistry, geology and mining, botany and zoology, as well as access to “a fully equipped Drawing-school, where, in addition to systematic exercises in elementary and free-hand drawing, instruction will be given in artistic design and modelling, as applied to manufactures, architecture, and decoration.”¹⁵ This drawing course for general students—Rogers imagined older workmen in pursuit of self-improvement and career-advancement—would be offered in two locations: the Normal Art School on Appleton Street and in the drafting rooms of the M.I.T. building on Boylston Street (FIGURES 7 AND 8), the same drafting rooms in which Ware’s architecture students studied during the day. Drawing instruction, like coding languages today, created a network that connected the different members and interests that comprised the field of American technology in the nineteenth century.

Like the “General or Popular Department,” which as a mode of public outreach helped to ensure that technology remained republican, M.I.T.’s “Special and Professional Department” relied on technical drawing to link its departments of mechanical, civil, and topographical engineering, building and architecture, practical and technical chemistry, and geology and mining. In Rogers’s “Scope and Plan,” these four-year courses were interrelated in a branch-like structure such that all students took the same courses in their first two years before specializing in separate fields. In the first year, all students enrolled in “Drawing, Linear and Geometric.” In the second year, all students took descriptive geometry and “Drawing: Geometric, Perspective, Light and Shadows.” In the third year, Rogers planned for engineers and architects to continue to study descriptive geometry and complete courses on the “Drawing of Machinery, Roofs, Bridges, Buildings, Maps, etc.” Other students, meanwhile, drew chemical apparatuses, laboratory arrangements, topographical maps and geological sections. In the fourth year, specialization was to proceed through drawing exercises that focused on the specific objects and environments that predominated in each subfield. Students in mechanical engineering would draw machines and plans for the layout of manufacturing plants; students in civil engineering would draw land surveys and topographical maps; chemistry students would draw facilities like “print-works” and “gas-works”; students in geology and mining would draw plans and sections of mines, quarries, and the machinery used in these spaces to make them productive; metallurgy students would draw cooking-ovens, furnaces, and refineries; and fourth-year students in the building and architecture department would draw “projects for dwellings, schoolhouses, churches, etc.”¹⁶ Rogers’s scheme demonstrated how the capacity for graphic representation was the means by which educators at M.I.T. translated the shop culture of the antebellum period into the school culture of the postbellum period. In the creation of the new paper world of technology, students could begin to explore the scientific basis of their different fields, but the shared experience and situated learning of objects and tools in specific occupational environments was lost, along with the communal, sometimes radical spirit of artisanal republicanism that these occupational environments tended to foster.¹⁷

Rogers's general scheme for M.I.T. determined the architectural curriculum that Ware later developed in his "An Outline of a Course of Architectural Instruction," which he formulated in 1865 to be "consonant with the general scope of the Institute" and published in 1866.¹⁸ Indeed, the most likely reason why Ware's "Outline" (FIGURE 9) did not specify how the architecture program would conduct drawing instruction was because Rogers had already do so in the "Scope and Plan." M.I.T.'s institutional identity meant that when Ware became involved in the Drawing Act of 1870, he did so as someone who was associated with the values of the useful arts and technology, not as an advocate of the *École des Beaux Arts* theory of design. M.I.T.'s architecture program took a pedagogical turn to the *École* only after January of 1872, when Ware, frustrated by the inconsistent quality of design work that M.I.T. students had demonstrated in the first three years of the department, successfully recruited the master draftsman Eugene Letang to leave the *École* and join his faculty as the lead studio instructor.

Like the 1870 Drawing Act, one of the two primary goals of Ware's architecture program was to produce draftsmen, not architects (the other goal was to serve as a clearinghouse for new architectural information). Just as he had questioned his own artistic ability in the 1850s, when he established the program at M.I.T. in the 1860s Ware thought that it was best to assume that architectural design, the artistic dimension of architectural practice that depended on talent and inspiration, was not something that the school could teach either to students or the general population. Instruction in drafting, on the other hand, was teachable and made this higher realm available to those with born genius. Architectural professionalism was essentially a bottom-up phenomenon for Ware; eliminate the many pragmatic, quotidian technical demands that constrain an architectural practice through want of good draftsmen, and a liberal culture of design would eventually emerge in the United States. Leopold Eidlitz, a New York architect who Ware knew through the A.I.A. was campaigning for a "Grand School of Architecture" at this moment, but Ware thought that it was unnecessary and essentially un-American.¹⁹ Such a top-down scheme, from Ware's perspective, was culturally and institutionally implausible given the country's decentralized educational tradition. In Ware's assessment, professional architects could take control of the construction industry if architecture schools could supply them with draftsmen.

The profession is, at present, in the hands of mechanics, many of whom are first-rate; of contractors and superintendents, who are mechanics with a talent for affairs, and many of whom take the name of architects; of architects proper, few of whom have an adequate training in the higher branches of their calling, while they are, of course, vastly inferior to the others in a knowledge of the lower branches; and, lastly, of architects' assistants and draughtsmen. It is upon these last that the whole system turns; and in any community the character of the work done depends, in a great degree, upon their attainments and qualifications. Any prosperous architect must leave nine drawings out of ten to be made entirely by his subordinates, under supervision, of course, more or less minute. If they are ignorant, the work suffers.²⁰

Ware envisioned the purpose of the American architecture school at a moment when the technical complexity of most non-domestic buildings had begun to exceed the capacities of any single individual. Educating workers to become draftsmen and then employing them as assistants and building-site superintendents would free the architect to concentrate on “his own proper work, to that elaboration and perfection of his design which no one else can do for him, the time and attention, the unencumbered leisure and mind at ease, which are needed for his anxious and delicate task.”²¹ The draftsman, in other words, was not only a labor-saving device, but also a means of insulating or disengaging the professional architect from the technical demands and psychological worries that impinged on artistic freedom and the reflective concentration needed for design. Like the assistant in the scientific laboratory, Ware did not envision the draftsman as contributing to the process of design as a collaborator or member of a team. Instead, the draftsman made possible the individuality and authorship of the professional as a silent intermediary. In producing a supply of skilled, technical assistants that allowed architects to retreat into their own minds, where they could resolve problems of form and style, Ware’s curriculum would spur disciplinary progress as it addressed more immediate industrial needs.²²

Ware’s “Outline” indicates that he had been considering the general problem of how to increase the labor supply of draftsmen as early as 1865, four years before Secretary White contacted him as an expert on drawing education. The industrial context in which Ware presented his “Outline” also suggests that when making appeals to the public about the need for architectural education, he had good reason to align his arguments rhetorically with the vocational figure of the draftsman instead of the professional figure of the architect. In the 1860s, it was clear that these two identities were mutually constitutive, and that the former might be far more important to potential institutional patrons than the latter. Closer to the end of the century, as concerns over industrial production transformed into interests in mass consumption, a rigid hierarchy emerged that separated these two figures and their respective modes of graphic representing—drafting and designing. The draftsman, once central to architecture’s professionalization movement because of widespread interest in skilling the industrial workforce, then became subordinate to the artistic identity of the professional.²³

A Transatlantic Network: Ware’s Trip to Europe

In addition to building credibility as an expert through his affiliation with a technology institute like M.I.T., Ware also proactively fashioned himself as a drawing expert through travel and study abroad. In 1866, after Ware published his “Outline of a Course” but before M.I.T. accepted its first class of students, Rogers agreed to send Ware on a sixteenth-month tour of European art academies and drawing schools. This kind of directed travel or professional research, closer to industrial tourism than a Grand Tour or a vacation, was common in nineteenth-century America and, like world fairs, was one of the ways that technical expertise flowed across geographical and institutional boundaries.²⁴ Not only did travel expose Americans to foreign styles and methods of practice, but it also helped them publicize their expertise upon return, provided that the

travelers had some ability to translate their personal experience into a cultural resource that could be shared with others.

Many American travelers accomplish this translation task by becoming authors and publishing their writing, sketches, and later in the century, photographs, as articles in literary magazines or as books. Frederick Law Olmsted's writings in the 1850s, for example—*Walks and Talks of an American Farmer in England* (1850), *A Journey in the Seaboard Slave States* (1856), and *A Journey through Texas* (1857)—was the basis of his pioneering career as a landscape architect during an era when landscape architecture as an academic or professional field did not, for all intents and purposes, exist in the United States. Likewise, Charles Eliot Norton's authority as an architectural historian of medieval Europe stemmed from his *Notes of Travel and Study in Italy* (1859).²⁵ Ware did not have a literary persona in the 1860s, though he referenced his familiarity with foreign systems of drawing instruction in government reports and throughout his career with the Massachusetts Normal Art School, M.I.T., and later, Columbia University. While some Americans traveled for nationalist reasons, in search of a comparative perspective that was necessary to understand what it meant to be American, Ware traveled with the attitude of an internationalist in search of the best methods of practice and as a representative of the A.I.A.

Ware's study tour began in Britain, where after visiting a number of different northern cities he eventually reached the South Kensington Schools of Design in London. In "On the Condition of Architecture and Architectural Education in the United States," a paper that Ware delivered to the Royal Institute of British Architects (R.I.B.A.) in late January of 1867, he thanked Thomas Leverton Donaldson, the co-founder and President of R.I.B.A. and a professor at the University College London, and R.I.B.A.'s Secretary of Foreign Correspondence for providing him with a circular letter which, Ware wrote, "has obtained for me in every part of England and in Scotland, courtesies and kindness from the Fellows and Associates of this Society for which I cannot sufficiently express my obligations."²⁶ Ware used this letter to meet with Matthew "Digby" Wyatt, the organizer of the 1851 Great Exhibition at the Crystal Palace, and Alexander J. Beresford Hope, who was in charge of the Architectural Museum at South Kensington. Either Wyatt or Hope introduced Ware to Matthew Arnold, who was then completing a government report on the state of the English secondary schools. Ware also observed drawing classes at the West London School of Art and the Workingmen's College on Great Ormond Street, which were led by John Ruskin. Ware was apparently unimpressed by Ruskin; he made little mention of him in his diary. A large portion of Ware's time in London he spent visiting architectural offices, publishers, and bookstores to acquire drawings, books, journals, and models for the architecture department at M.I.T.²⁷

Ware was greeted by the British as an ambassador of the American architectural community, and although the hospitality that he received seemed to have been given generously, it was still tinged with the slight condescension that often underscores center-periphery interactions. In Ware's speech to R.I.B.A., he mounted photographs around the meeting room and used them to introduce the work of leading practitioners like Thomas U. Walter, Richard Upjohn, Richard Morris Hunt, Leopold Eidlitz, and Detlef

Lienau to the audience. Antebellum American architecture had sunken into a state of chaos; it was a period when “the traditions of professional etiquette and the old-fashioned way of doing business, so far as we had ever inherited them from the mother country, fell into abeyance and were forgotten.”²⁸ These practitioners, all members of the A.I.A., were leading American architecture out of a state of transition. He then described America’s vernacular wooden architecture and the paltry educational options available in the United States. Aside from collecting teaching materials, Ware stated, deferentially, that the purpose of the trip was “to perfect our plans by the study of European Schools of Art, and to chasten our judgments and correct our aims by the counsel of men whose insight or experience fits them to be our counsellor.”²⁹ Donaldson thanked Ware for “the simple, unaffected and plain statement they had heard from their American colleague,” stereotypical attributes that the British frequently associated with nineteenth-century Americans. “Nothing,” Donaldson said, “could be more agreeable to their feelings than these opportunities of giving a welcome to their professional friends, from whatever part of the world they came—more particularly those who held the relation of brethren both in blood and feeling.”³⁰ Donaldson referred to the Americans as an “inventive” people who, now that they were beginning to enjoy increased prosperity, he expected to soon develop architecture into a fine art. Wyatt referred to America as a future “great commercial head,” thanking Ware while asking him for more information about America’s “big” architecture—grand hotels, department stores, and warehouses. Had there been any sort of professional rivalry between the American and British architectural communities in the 1860s, Ware might not have been as free as he was to visit and study what interested him. Because there was no such rivalry, he was able to use the presumed cultural hierarchy between his hosts and the United States to his advantage.

Ware then travelled throughout Continental Europe, including Italy, Germany, and France, with two extended stays in Paris. In his first visit to Paris, Ware met with Émile Trélat, the Director of the École Centrale d’Architecture, a radical new school founded in 1865 as a rebuttal to the École des Beaux Arts. Trélat’s curriculum for the École Centrale, a private school, was in many ways like Ware’s initial plan for M.I.T. in that it concentrated on teaching mechanical drafting and the more technical aspects of architectural practice rather than aspiring to teach architecture as a fine art.³¹ Ware did not, however, allow Trélat’s hostility to the École des Beaux Arts to affect his own interest in France’s most elite art academy. He attended lectures there and also Grand prix exhibitions, eventually sat down with Eugene Guillaume, the school’s director, visited several of the École’s architectural ateliers, and even studied rendering in the Atelier Daumet for the final two months of his trip in order to better understand the École method of *dessin*. While he was in Paris, Ware also met with Victor Duruy, the Minister of Public Education and one of the Third Republic’s most progressive reformers, to discuss drawing at the primary and secondary school levels. The cultural scope of Ware’s investigations is remarkable here, as he followed the bifurcation of drawing in French education between drafting for industry and designing for art.³² Ware was mixing his more restricted interests in architecture with his interests as an advocate of drawing reform.

Once he returned home, Ware's experience abroad made him a valuable resource to other educators and public officials involved in drawing reform. Few other advisors to the 1870 Drawing Act would have had a comparable experience, given the degree to which Ware's institutional affiliation with M.I.T. and his professional affiliation with the A.I.A. made accessible foreign expertise in drawing.

Finally, although the topic is too large and complex for the present study, it is worth noting the legal context that made Ware's rapid accumulation of drawing knowledge possible. Ware travelled soon after European and American courts extended copyright protection from literary authorship to the original work of architects, designer, and other visual artists. Copyright protection promoted professional collaboration and collective notions of expertise. In contrast, when Ware studied with Hunt in the late 1850s, Van Brunt described the New York architecture scene in terms of widespread distrust.

The hand of each was turned with jealousy and suspicion against his brother. His processes of design and his business methods were personal secrets. Each concealed his drawings from the rest as if they were pages of a private diary. Even books and prints were carefully excluded from inspection by any rival. Pupils were apprentices, and as in my own case, often looked with eager and unsatisfied eyes through the glass of their master's locked bookcases.³³

Such suspicion was widespread among American architects prior to Ware and Van Brunt's generation. Then in 1861, after Hunt sued his first American client for refusing to pay his design services fee—the client claimed to have bought Hunt's drawings—a New York court established the architect's legal right to the ownership of his drawings. In 1862, after the passage of a number of International Copyright Acts, legislators in England passed the Fine Arts Copyright Act, which extended copyright protection specifically to original drawings (including works of architecture), paintings, and—most controversially—photographs. America's patent system was strong throughout the nineteenth century, protecting the rights of inventors and encouraging them to share technical drawings, but in the 1860s copyright protections in the United States and Europe made architects, engineers, and inventors more willing than ever before to loan and display drawings for the sake of professional and educational development.³⁴ The transition in intellectual property status of drawings was not immediate, but Ware studied foreign drawing systems at a time when these systems were becoming public knowledge.

Conclusion

Throughout the 1870s, as the department of architecture at M.I.T. grew, Ware continued to fashion his professional persona as a drawing expert by joining the faculty of the Massachusetts Normal Art School (established in 1873) and by serving as a planning advisor to the School of Painting and Drawing for Boston's Museum of Fine Arts. Drawing reform connected Ware to a network of New England reformers that included government officials, public school educators, industrialists, technologists, and artists

and provided him with an opportunity to become a public figure by virtue of his affiliation with M.I.T. While other American architects in the 1860s debated whether architectural education in the United States should create a national school of architecture based on French academic or German polytechnic models of schooling, Ware responded to regional concerns by placing architectural education in direct relation to industrial society, leading him to identify an alternative source of credibility: knowledge of technical drawing. Other American architects may have built more and designed better, but the expertise in draftsmanship that Ware acquired in the 1860s positioned him to become the preeminent architectural educator for the rest of his career.

Endnotes to Chapter One

¹ Stephen Greenblatt, *Renaissance Self-Fashioning: From More to Shakespeare* (Chicago: University of Chicago Press, 1980).

² Steven Shapin and Simon Schaffer, *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life* (Princeton, N.J.: Princeton University Press, 1985); Steven Shapin, *A Social History of Truth: Civility and Science in Seventeenth-Century England* (Chicago: University of Chicago Press, 1994).

³ Elizabeth Merrill, "The Professione Di Architetto in Renaissance Italy," *Journal of the Society of Architectural Historians* 76, no. 1 (March 1, 2017): 13–35.

⁴ Andrew Saint, *The Image of the Architect* (New Haven: Yale University Press, 1983).

⁵ Quoted in Kimberly Alexander-Shilland, "Ware and Van Brunt: Architectural Practice and Professionalization (1863-1881)" (Ph.D., Boston University, 1999), 14.

⁶ Quoted in Alexander-Shilland, 72.

⁷ The English sociologist R.H. Tawney first defined the professional as a "social trustee" in *The Acquisitive Society* (New York: Harcourt, Brace and Howe, 1920). Tawney idealistically assumed that professional work was moral insofar as it was motivated by more than a desire for individual commercial gain. Professional organizations compelled their practitioners to abide by a shared ethic that was committed to civic or social responsibility. Steven Brint argues that the heyday of social trustee professionalism was between 1880 and 1930. By the middle of the nineteenth century, an emphasis on technical knowledge replaced the moralism at the basis of professionalism, leading to the age of technocrats. See also *In an Age of Experts*, Reprint edition (Princeton, NJ: Princeton University Press, 1996).

⁸ Peter Becker and William Clark, eds., *Little Tools of Knowledge: Historical Essays on Academic and Bureaucratic Practices*, Social History, Popular Culture, and Politics in Germany (Ann Arbor: University of Michigan Press, 2001). Although military engineers in the United States received a comprehensive training at West Point, American military academies never determined government policies for civilian education. See M. J. Anderson, "The Architectural Education of Nineteenth-Century American Engineers: Dennis Hart Mahan at West Point," *Journal of the Society of Architectural Historians* 67, no. 2 (June 1, 2008): 222–47.

⁹ On the iconography of craftsmen and hammers in the antebellum period, see Harry R. Rubenstein, "With Hammer in Hand: Working-Class Occupational Portraits," in *American Artisans: Crafting Social Identity, 1750-1850*, ed. Howard B. Rock, Paul A. Gilje, and Robert Asher (Baltimore: Johns Hopkins University Press, 1995), 176–98.

¹⁰ On the institutional mission of M.I.T., see Julius Adams Stratton and Loretta H Mannix, *Mind and Hand: The Birth of MIT* (Cambridge, Mass.: MIT Press, 2005); A. J Angulo, *William Barton Rogers and the Idea of MIT* (Baltimore: Johns Hopkins University Press, 2009). On the Franklin Institute, see Bruce Sinclair, *Philadelphia's Philosopher Mechanics; a History of the Franklin Institute, 1824-1865*. (Baltimore: Johns Hopkins University Press, 1974). On the epistemological hierarchy between the liberal and the mechanical arts, see Antonio Pérez-Ramos, *Francis Bacon's Idea of Science and the Maker's Knowledge Tradition* (Oxford [England]; New York: Clarendon Press ; Oxford University Press, 1988); Lissa Roberts, Simon Schaffer, and Peter Dear, eds., *The Mindful Hand: Inquiry and Invention from the Late Renaissance to Early Industrialisation*, History of Science and Scholarship in the Netherlands, v. 9 (Amsterdam : [Bristol: Koninklijke Nederlandse Akademie van Wetenschappen ; University Presses Marketing distributor], 2007); Pamela H Smith, *The Body of the Artisan: Art and Experience in the Scientific Revolution* (Chicago: University of Chicago Press, 2004).

¹¹ William B. Rogers, *Objects and Plan of an Institute of Technology Including a Society of Arts, a Museum of Arts, and a School of Industrial Science*, Second (Boston: John Wilson and Son, 1861), 28.

¹² Joseph F. Kett, *The Pursuit of Knowledge under Difficulties: From Self-Improvement to Adult Education in America, 1750-1990* (Stanford, Calif.: Stanford University Press, 1994). Mary Ann Stankiewicz writes, "The word industrial used in the legislative act [the 1870 Drawing Act]...had mixed connotations in the mid-nineteenth century. The word referred to productive labor. In this sense, an industrial school or subject—like industrial art education—taught skills necessary for workers in manufacturing. At the same time, industrial schools were intended to establish habits of order, thrift, and industry, purifying and elevating the moral nature of the working classes. And yet another connotation of the term industrial

school referred to a school for neglected, potentially delinquent children. In this sense, an industrial school was a reform school, intended to teach docile, rule-governed behavior. Given these connotations, legislators might have interpreted industrial art education as a means to control masses of future workers, as well as teach them useful skills. The phrase industrial or mechanical used in the Drawing Act added another level of confusion. Many towns misinterpreted the phrase as treating the words as synonyms; they established only mechanical, technical drawing classes, ignoring women who wanted to enroll.” *Developing Visual Arts Education in the United States: Massachusetts Normal Art School and the Normalization of Creativity*, 2016, 54–55.

¹³ James D Anderson, *The Education of Blacks in the South, 1860-1935* (Chapel Hill: University of North Carolina Press, 1988); Ellen Weiss, *Robert R. Taylor and Tuskegee: An African American Architect Designs for Booker T. Washington*, 1 edition (Montgomery Ala.: NewSouth Books, 2011); Clarence G. Williams, “From ‘Tech’ to Tuskegee: The Life of Robert Robinson Taylor, 1868-1942,” accessed July 24, 2018, https://libraries.mit.edu/_archives/mithistory/blacks-at-mit/taylor.html.

¹⁴ Eric Schatzberg, *Technology: Critical History of a Concept*, First edition (Chicago ; London: University of Chicago Press, 2018); Eric Schatzberg, “‘Technik’ Comes to America: Changing Meanings of ‘Technology’ before 1930,” *Technology and Culture* 47, no. 3 (2006): 486–512. Jonathan Kasson discusses technology in relation to the ideology of American republicanism in *Civilizing the Machine: Technology and Republican Values in America, 1776-1900* (New York: Penguin Books, 1977).

¹⁵ William Barton Rogers, *Scope and Plan of the School of Industrial Science of the Massachusetts Institute of Technology* (Boston: John Wilson and Son, 1864), 5.

¹⁶ Rogers, 6–16.

¹⁷ On artisanal republicanism, see Sean Wilentz, *Chants Democratic: New York City and the Rise of the American Working Class, 1788-1850* (London, UK; New York: Oxford University Press, 2004). On the transformation of shop culture into school culture, see Monte A Calvert, *The Mechanical Engineer in America, 1830-1910; Professional Cultures in Conflict* (Baltimore: Johns Hopkins Press, 1967).

¹⁸ William R. Ware, *An Outline of a Course of Architectural Instruction* (Boston: John Wilson and Sons, 1866), 13.

¹⁹ Kate Holliday, “‘Build More and Draw Less’: The AIA and Leopold Eidlitz’s Grand Central School of Architecture,” *Journal of the Society of Architectural Historians* 65, no. 3 (2006): 378–401.

²⁰ William R. Ware, *Outline of a Course*, 12.

²¹ William R. Ware, 12.

²² Draftsmen in the United States would not have an official voice until 1902, when the first issue of *The Draftsman* appeared. For an assessment of draftsmen in architecture around the turn of the century and afterwards, see George Barnett Johnston, “Drafting Manuals and Manual Training: Rouillion and Ramsey’s ‘Architectural Details,’” *Journal of Architectural Education (1984-)* 58, no. 4 (2005): 41–52; George Barnett Johnston, *Drafting Culture: A Social History of Architectural Graphic Standards* (Cambridge, Mass.: MIT Press, 2008). My reading of Ware’s interest in draftsmen has been influenced by Shapin’s analysis of “invisible technicians” and the professional scientist’s need for reflective peace, see Steven Shapin, “The Invisible Technician,” *American Scientist* 77, no. 6 (1989): 554–63; Steven Shapin, “‘The Mind Is Its Own Place’: Science and Solitude in Seventeenth-Century England,” *Science in Context* 4, no. 1 (ed 1991): 191–218. Henry Van Brunt addressed the need for professional solitude in his 1875 introduction to the English translation of Eugene-Emmanuel Viollet-le-Duc’s *Entretiens sur l’architecture*. He wrote: “Indeed, all the conditions of life in this country encourage the architect to habits rather of rapid composition than of study and reflection, and tend to make of his occupation rather a business than a fine art. The ‘strenuous liberty’ which we have inherited involves a constant and often harassing struggle for existence. Therefore the aim of the architect is to multiply his opportunities of professional work to the utmost extent, having in view, first, his pecuniary emoluments of course, and, second, his art. Under these circumstances he has no time to review his studies; he cannot afford, after his first sketches are made and his work in progress of routine development in his office, to distrust and chasten his favorite *motifs*, with the solicitude and patience of an artist aiming at perfection like the Greek; much less, having discovered on reflection a new condition in his problem which would enable him perhaps to raise to a higher plane of artistic excellence or fitness the whole sentiment of his work, to throw aside his old labors and begin anew. This costs too much. If the products of routine and of conventionality will satisfy his impatient public, he has the strongest impulse under the circumstances to content himself with the superficial appearance, and let the substance of art go for those who can afford it. Art is a mistress who is wrong by no such partial service. Henry Van Brunt, *Architecture and Society; Selected Essays of Henry*

Van Brunt, ed. William A Coles (Cambridge, Mass.: Belknap Press of Harvard University Press, 1969), 109.

²³ The story of the subordination of the draftsman to the architect is recounted in Johnston, *Drafting Culture*.

²⁴ On American travel to Europe in the nineteenth century, see William W. Stowe, *Going Abroad: European Travel in Nineteenth-Century American Culture* (Princeton, N.J: Princeton University Press, 1994); Foster Rhea Dulles, *Americans Abroad: Two Centuries of European Travel* (Ann Arbor: University of Michigan Press, 1964); Harvey Levenstein, *Seductive Journey: American Tourists in France from Jefferson to the Jazz Age*, 1 edition (University of Chicago Press, 2000). On the limitations of travel pedagogy in architecture, see Kay Bea Jones, "Unpacking the Suitcase: Travel as Process and Paradigm in Constructing Architectural Knowledge," in *Discipline Of Architecture*, ed. Andrzej Piotrowski and Julia Williams Robinson, First edition (Minneapolis: University Of Minnesota Press, 2000), 127–57.

²⁵ Frederick Law Olmsted, *Walks and Talks of an American Farmer in England* (Amherst, Massachusetts: Library of American Landscape History ; Distributed by University of Massachusetts, 2002); Frederick Law Olmsted, *A Journey in the Seaboard Slave States: With Remarks of Their Economy*, Todd A. Herring Collection (Mississippi State University. Libraries), 1856; Frederick Law Olmsted and Larry McMurtry, *A Journey through Texas: Or, A Saddle-Trip on the Southwestern Frontier* (Austin: University of Texas Press, 1978); Charles Eliot Norton, *Notes of Travel and Study in Italy* (Boston: Houghton, Mifflin, 1859).

²⁶ William R. Ware, "On the Condition of Architecture and of Architectural Education in the United States," *Papers Read at the Royal Institute of British Architects Session 1866-1867* (January 28, 1867): 81. This paper was reprinted in abbreviated form as William R. Ware, "The Condition of Architecture and Architectural Education in the United States," *The Builder* 25 (March 2, 1867): 144–47.

²⁷ The itinerary of Ware's tour is recorded in J. A Chewning, "William Robert Ware and the Beginnings of Architectural Education in the United States, 1861-1881" (Massachusetts Institute of Technology, 1986), 55–64.

²⁸ William R. Ware, "On the Condition of Architecture and of Architectural Education in the United States," 82.

²⁹ William R. Ware, 87.

³⁰ William R. Ware, 88.

³¹ Shelley Hornstein-Rabinovitch, "Architecture on the Edge: Stephen Sauvestre, the École Centrale d'Architecture, and Marginalist Practice," *Journal of Architectural and Planning Research* 7, no. 3 (1990): 209–21.

³² On Ware's trips to Paris, see Chewning, "William Robert Ware and the Beginnings of Architectural Education in the United States, 1861-1881," 68–71.

³³ Van Brunt, *Architecture and Society; Selected Essays of Henry Van Brunt*, 335.

³⁴ On Hunt's lawsuit, see Alan Burnham, "The New York Architecture of Richard Morris Hunt," *Journal of the Society of Architectural Historians* 11, no. 2 (1952): 9–14. On copyright in the 1860s, see B. Zorina Khan, *The Democratization of Invention: Patents and Copyrights in American Economic Development, 1790-1920*, NBER Series on Long-Term Factors in Economic Development (New York: Cambridge University Press, 2005); Ronan Deazley, "Breaking the Mould? The Radical Nature of the Fine Arts Copyright Bill 1862," in *Privilege and Property: Essays on the History of Copyright*, ed. Ronan Deazley, Martin Kretschmer, and Lionel Bently (Cambridge: Open Book Publishers, 2013), 289–320.

Chapter Two

After Apprenticeship: Drawing and the Need for Skill in the 1870s

The unofficial theme of the American Institute of Architect's Fifth Annual Convention was education. On November 14th and 15th of 1871, members of the Institute from New York, Philadelphia, Chicago, Cincinnati, Boston, and Baltimore assembled in the Rogers Building at M.I.T. to review their progress as professionals and to hear from three leaders of New England's education reform movement: John Runkle, a mathematician and advocate of manual training who in 1870 became president of M.I.T.; Charles Eliot, the new president of Harvard College; and the drawing czar Walter Smith, the State Director of Art Education for Massachusetts and the soon-to-be head of the Massachusetts State Normal Art School. Ware was in charge, and he was proud to show off both the growth of his architecture department and his work on behalf of the 1870 Drawing Act. In preparation for the Convention, Ware mounted an exhibition on the second floor of the Rogers Building that featured student work from the various public school programs initiated by the Act, as well as student drawings from English, French, German, and Belgian art schools to demonstrate that American art education was catching up to Europe. After inviting his colleagues to visit the exhibition, he assured them that it represented, "One of the most interesting collections of drawings that has been made about here, and the beginning, perhaps, of the most extensive and systematic course of artistic instruction which has been set on foot in this country."¹ Everyone agreed. Henry Sims, the Secretary of Foreign Correspondence for the A.I.A., motioned a resolution of support for the 1870 Drawing Act documented in the Convention's minutes. "The time is not far distance when other cities in this extended land of ours will imitate the example of Boston, in establishing systematic courses of instruction in the art which is, more than any other, necessary to the material growth and improvement of the country at large."²

The theme of education and Ware's selection of these speakers furthered a strategic alliance between the architecture profession and vocational reform. By 1871, the A.I.A. was looking to expand the collegiate system of architectural education and was in need of powerful allies within university administrations. There were then only five Institute-recognized collegiate architecture programs: M.I.T, Cornell, the Worcester County Free Institute of Industrial Science, the Polytechnic Institute of Philadelphia, and the Cooper Union.³ Alternatively, by 1871, school and college administrators in New England had begun to address their region's vocational training needs through art education. Architecture was for them a discipline that might help to lead the way in vocational reform by placating skeptics who remained committed to more traditional forms of education; a discipline on the liberal end of the technical arts. The support of expert draftsmen in the architectural establishment would help these educational reformers expand their curricula and the scope of legislation like the 1870 Drawing Act.

Each invited speaker reiterated the importance of the alliance. Eliot began his address to the A.I.A. by joking that the expansion of Harvard's campus was an indication that the school might as well offer courses in architecture. "Harvard College has become wholly devoted to bricks and mortar and material science, to the exclusion of literature, philosophy, and religion," he pronounced facetiously, inciting laughter and cheers from the audience of designers.⁴ The joke only worked because the thought of an architecture department at Harvard, still twenty-two years away, seemed incredible.⁵ When it was Runkle's turn to address the audience, he reassured them that M.I.T. remained deeply committed to architectural education. "You may suppose that the engineering profession absorbs all the interest of the Institute," he stated. "This is by no means the case. We know no difference."⁶ Finally, in his plenary address, Smith reminded the A.I.A. that art education, as a means of popularizing drawing instruction and art appreciation, was critical to the long-term success of the profession. "To educate the masses of the people to appreciate works of art and good taste," Smith stated, "and to appreciate that which gives to architects their profession, there ought to be a general education in art for the masses of people."⁷ Smith was adamant about the importance of art education to the growth of the architecture profession in the United States. "I do feel that if the work which the city has undertaken, is carried out conscientiously and well, it will be very much in the shape of a foundation for what you have to do," Smith told the A.I.A. He then repeated the metaphor: "I do hope that when we have educated the public, and you have administered to their wants architecturally, you will feel that our foundation work of driving the piles in the popular mind, has not been altogether without effect...My own work here [in Massachusetts] is very much like driving the piles upon which you have to erect your super-structure."⁸ In attending the Convention and reiterating the dependency of the architecture profession on public art education, Smith was making an appeal for the support of architects. He wanted them to follow Ware's example in linking architectural education to drawing. Architects were experts in drawing, after all; they could help to replicate the 1870 Drawing Act all over the country.

Instead of vocational reform and art education, the theme of the Fifth Annual Convention *should* have been fire safety. Just a month earlier, the city of Chicago was engulfed in an epic conflagration. The Great Chicago Fire, as it quickly came to be known, caused nearly \$200 million in damage, left 100,000 people homeless (one-third of the city's population), and levelled 2,100 acres of property. Approximately 175,000 structures, including 18,000 buildings were destroyed. Most of these structures were made from wood; Chicagoans expected them to go up in flames. The larger brick and iron buildings that collapsed were supposed to have been fire-proof. They weren't. When the exposed cast iron structure of these buildings melted, it made the conflagration much worse.⁹

The architects who attended the Fifth Annual Convention in Boston did not, however, interpret the catastrophe in Chicago as evidence of their own ineptitude as builders. Instead, they either ignored the event or used it as further evidence that they should be in control of the construction industry and urban development. P.B. Wight, the architect

of the National Academy of Design in New York, boldly characterized the Great Chicago Fire as a freak occurrence. “Of course, this fire was no ordinary experience,” he insisted, avoiding any sort of professional culpability. “It raged with an intensity heretofore unknown, and it is hardly possible that such an event can happen again. It is not probable for it to happen in a city like New York or Boston.”¹⁰ A.J. Bloor, Secretary of the New York Chapter of the A.I.A., blamed the fire on Chicago’s incompetent builders and reckless real estate moguls who had risked public safety for the sake of profit. “That destruction, surpassing that of the ancient cities of the plain, may fall, with fiery shafts, on a modern city of the prairie, if the narrow provincialisms of mechanical handicraft and the short-sighted selfishness of commercial speculation be not guided and tempered by the judicial and benign authority of thoroughly and broadly educated experts.”¹¹ Wight and Bloor were both terribly wrong. Almost exactly a year after the Fifth Convention, on November 9th and 10th of 1872, Boston went up in flames as well, razing a significant portion of the downtown area, including the main financial district.¹²

Ware and the other planners of the Convention could not have known ahead of time that the Great Chicago Fire was going to occur, but the fact that the attendees remained concentrated on drawing reform and not, for example, building safety was a testament to the importance of this topic in the early 1870s. For New England manufacturers, drawing reform represented the solution to a crisis of skill initiated by the collapse of the American apprenticeship system in the middle decades of the nineteenth century. Learning to draw programmed a new kind of laborer to fit within a factory environment that demanded the precise coordination of machines and men. Architects had a part to play in responding to this crisis because they were expert draftsmen in a country still in the midst of constructing a popular system of art education. In this context, it was advantageous for American architects to project an image of themselves as graphic experts rather than as builders.

But Ware did not stop there. Rather than accept the limited purpose of drawing instruction as a means of producing skilled workers, he turned the rhetoric of drawing reform against the education system, redirecting the industrial crisis of skill toward the recognition of new forms of literacy or learning styles that the classical or religious curricula had previously ignored.¹³ The thesis of this chapter is that the expansion of the collegiate system of architectural education was predicated on two historical changes that worked in conjunction with one another. First, growing public desire for drawing as a method of producing skilled workers. And second, academic recognition of cognitive differences in learning and scholarship, or a variety of intellectual modalities, including visual thinking. To borrow Walter Smith’s structural metaphor, the economic need for skill “drove the piles” and set the groundwork for architecture’s rising cultural authority as a legitimate academic discipline.

The chapter will describe drawing’s relationship to skill and thought in three sections of cultural history. First, I review the collapse of the American apprenticeship system in order to establish a point of comparison for how skill was transmitted prior to the rise of the factory system. Second, I describe how skill emerged as an abstract category of economic thought as work shifted from artisanal to industrial production and how the

abstraction of skill from the work process changed the meaning of skill. These two sections constitute what one might call the social problem that drawing education attempted to redress. Then in the third section, I describe the desire for managers and workers with technical drawing skills as part of a culture of control and how this desire transformed into a novel critique of educational institutions.

In addition to historians of architectural education, this argument should be of interest to anyone concerned with the history and politics of education since it tries to acknowledge the dual nature of vocationalism. On the one hand, educators like Ware, Smith, Eliot, and Runkle, each for their own separate reasons, advocates for American educators to respond to the economic needs of society. Drawing education instrumentalized learning, narrowing the purpose of education to job preparation. On the other hand, by encouraging other educators to recognize cognitive difference, these advocates staked out a progressive position that would eventually lead to the legitimation of new disciplines, some of which, like the design fields, were not fundamentally based on literacy or numeracy.¹⁴ The world of thought was much larger at the end of the nineteenth century than it had been a century before, and in this space the collegiate system of architectural education would grow.

The Collapse of the American Apprenticeship System: A Brief Review

In the prevailing account of the history of the architecture profession in the United States, Mary N. Woods characterizes professionalization as the conscious rejection of architecture's artisanal past. "Why did certain designers and builders decide to identify and organize themselves as professionals during the decades before the Civil War?" Woods asks, referring to antebellum American architects like Thomas U. Walter, Minard Lafever, Alexander Parris, and Ithiel Town. "Most of these men had trained and practiced as building artisans. Why did they reject the idea of architecture as craft in favor of architecture as profession?"¹⁵ What was for the antebellum a choice was for the postbellum generation a necessity. By the 1860s and 1870s, the apprenticeship system had collapsed, in architecture and for many other craft communities. From this point forward the skills once transmitted through apprenticeship would need to be reproduced through schooling. I want to explain why apprenticeship collapse because I am afraid that previous architectural historians have taken this transformation for granted without fully understanding what it entailed. Understanding the apprenticeship system and why it collapsed is one of the best ways to appreciate the radical novelty of the idea that art education in a school system could function to transmit technical skills.

After the War of 1812, two major trends undermined the American apprenticeship system: the increasing difficulty of enforcing labor contracts and the rapid growth of firm size. In Europe, the regulatory presence of guilds impeded the effects of these two trends on apprenticeship, but in North America, the absence of guilds facilitated the rapid adoption of the factory system of industrial manufacture in the Northeast. For W.J. Rorabaugh, "Vast distances [between communities], shortages of skilled labor, a largely agricultural population, and a poorly developed legal system" made the institution of

apprenticeship in colonial and antebellum United States different and weaker than its counterparts in Europe.¹⁶ Without guild regulation, any artisan in the United States could call himself a master, there was no training oversight (meaning that the apprentice never had to produce a masterpiece and shoddy workmanship was common), a master could take on as many apprentices as he liked, and imbalances in the ratio between apprentices, journeymen, and masters in a given labor pool could easily skew wages. Given these unregulated conditions, it is not surprising that few craftsmen in colonial America rose to the status of architects and that many projects relied on the leadership of British emigrant architects like Benjamin Latrobe, Peter Banner, and John Haviland.

The first trend that led to apprenticeship's decline was the increasing difficulty of enforcing long-term labor contracts, and thus the avoidance by masters of entering into such contracts. In modern economic terms, apprenticeship was viable only so long as masters were willing to allow apprentices to borrow on the collateral of their future human capital. Most masters accepted apprentices, in other words, not out of benevolence or intense devotion to continuing traditions within their craft community, but because the relationship as an investment in the apprentice's natural capacity to learn. When a domestic apprenticeship began, the apprentice contributed little to the productivity of the shop or building team but still received room, board, sometimes clothing, and an education that would eventually lead to financial independence and social status. Over time, as the apprentice lived and worked closely with the master, he gained skills and became more productive, allowing the master to recoup his initial investment. In the period before the apprentice became a journeyman and left the shop, when he had learned skills but remained under the masters control, he was maximally productive.

The apprenticeship system worked well if the apprentice, the family of the apprentice, and the master established credible social relations. In an ideal-typical model, the good master did not exploit the productivity of the apprentice by withholding valuable skills, keeping him in perpetual drudgery, or extending the apprenticeship period too long. Likewise, the good apprentice honored his contract. Fathers of apprentices often tried to establish credible relations in their initial contact with masters and by vouchsafing for the intentions of their sons. Trustworthiness was also part of the rationale behind domestic apprenticeship, when apprentices lived in the homes of their masters. In addition to facilitating the transfer of tacit knowledge and the inculcation of certain moral values by continuing interactions beyond the working day, living together was meant, at best, to promote filial affection and, at worst, to secure the master's investment by keeping the apprentice under a constant, watchful eye.

Near the end of the apprenticeship term was the period when an apprentice was most likely to breach his contract. In colonial and antebellum America, where there were no guilds to blacklist fugitive journeymen and a great demand for skilled labor, this often involved crossing the border from the legal jurisdiction of one colony or state to another, or migrating westwards to the settler communities on the frontier. Young Benjamin Franklin, for example, broke his contract as a printing apprentice in Boston (his older brother, James, was his master) and simply moved to Pennsylvania to set up his own

shop.¹⁷ To mitigate the likelihood of a breach of contract, Hamilton explains that there was a variety of enforcement mechanisms, including end payments (i.e. cash bonuses held until the completion of the apprenticeship, or sometimes tools or equipment necessary to become a journeyman), explicit parental liability (a stipulation in the initial contract that the parents or guardians of the apprentice would pay the master an agreed upon fee in the case of a breach), and, if necessary, the legal recourse of criminal prosecution.

All of these enforcement mechanisms became less effective as the nineteenth century wore on. One reason for their deterioration was urbanization. Waves of immigration through the antebellum period estranged masters from the families of apprentices in the artisanal labor pool. With less personal information available to each side and high geographical mobility, parental liability stipulations became riskier. Once the commitment to a long-term contract became riskier, contract length and end payments decreased, creating less of an incentive for the apprentice to stay. Masters responded to the new urban conditions by only taking on older apprentices who were likely to provide an immediate return on investment. Contracting the overall period of training made it more difficult to transmit higher-level skills. A second factor was legal. Following Robert J. Steinfeld's account of the rise of free labor ideology, once American judges re-conceptualized employment contracts as a covenant between two judicial equals rather than an exchange of property, American courts near the end of the antebellum period stopped prosecuting those who breached their contracts as criminals or compelling them to complete their terms of indenture. When employees gained the right to quit their jobs, masters lost some of the crucial legal protections that made apprenticeship a worthwhile investment.¹⁸

The second cause for the collapse of the American apprenticeship system was the rapid growth of firm size. Population growth and improvements to transportation infrastructure in the United States, including roads and turnpikes in the 1790s, canals in the 1820s, and railroads in the 1830s, made domestically produced goods cheaper. As the domestic consumption market for these goods expanded, so too did the capitalization of the manufacturing sector, eventually leading to the factory-based system of production and what some historians have called the "sweating system" of non-mechanized specialization. Business owners in the textile mills of Lowell, for example, harnessed new and more dependable sources of power to mechanize production and sell in bulk to wholesale markets, taking advantage of new economies of scale. As firm size grew and rates of production became more regular, specialized workers and the unskilled wage labor of women, children, and immigrants replaced the employment of handicraftsmen with all-around trade skills. Youth who might have entered long-term apprenticeship contracts at the beginning of the nineteenth century were no longer willing to delay earning power at midcentury when there were factory jobs available that paid weekly wages, even if these jobs were less interesting or respected than trade occupations.¹⁹

To be sure, there were several factors that contributed to apprenticeship's demise other than legal and economic changes. The growth of the American scientific community throughout the nineteenth century and the development of new technologies, especially

print-technologies, made traditional craft knowledge in many parts of the world either obsolete or much more accessible than they had been in the eighteenth century. George Cary Eggleston's aptly-titled *How to Educate Yourself: With or Without a Master* (1872; FIGURE 10), which offered literate members of the mechanical classes advice on how to construct their own course of study from local apprentices' and mechanics' libraries, was part of the popular new genre of technical self-help literature. What books like Eggleston's demonstrate is that as the artisan turned into the worker, the master turned into the boss through a parallel process of disenchantment. Education and self-improvement no longer seemed to demand overt submission to the will of someone whose claims to mastery were increasingly exposed as partial. "Traditionally," Rorabaugh explains,

The master's authority had rested on his technical expertise and on an aura of mystery, captured in the language of the indentures, that surrounded that expertise. The boyish apprentice was to be in awe of his master both because he knew so much and, perhaps more important, because of the seeming magic by which the knowledgeable master turned raw leather into shoes, wood into barrels, or paper, type, and ink into books. To an untrained youth, the myriad processes, the little rituals invoked at each step, and the repetitions that always produced the same result were a form of magic. The craft books stripped away that magic, and if a youth could read, he could discover the processes of his craft on the sterile printed page. The master ceased to be a magician and became only one of a thousand followers of a routine.²⁰

The authority of the boss was merely economic: he organized the work process and distributed cash wages. Unlike the master, this figure was not a guardian or teacher *in loco parentis*. For better or worse, the moral, educational, and social dimensions of the master's role eroded.

Insofar as architecture was linked to the artisanal world through trades like carpentry and masonry, the disenchantment of the trades disrupted well-worn paths into the profession. Like the title of Eggleston's book, Edward Shaw's *The Modern Architect; Every Carpenter His Own Master* (1854; FIGURE 11) suggested that the concepts of mastery and architectural authority were diverging and that the transformation of a drawing set into a building was not as awesome as it once was. Shaw was born in 1784 to a family of New Hampshire builders. He apprenticed as a housewright before going on to design and build homes for wealthy merchants around Boston. Although his occupational path was steadily closing throughout the antebellum period, the promise that his book made to its imagined readership of young autodidacts was that one could bypass or at least drastically reduce the term of apprenticeship by supplanting it with independent study. In the lineage of Asher Benjamin's *The Country Builder's Assistant* (1797) and Lafever's *The Young Builder's General Instructor* (1829), Shaw's *Modern Architect* was a cookbook of compiled design and construction knowledge from a wide array of sources. The subtitle of the text, though, was an indication that architectural education was changing. Once based on the lessons that the master passed informally

to the apprentice, it would soon be formalized with school environments and school curricula.²¹

Another crucial difference between the artisanal building world of the antebellum period and the modern construction industry was the accelerated rate of production. In the building trades, craft skill did not decline because of mechanization (i.e. direct replacement of machinery for trade labor). Mechanization depended on a controlled, enclosed working environment like a factory where power could be evenly and continually distributed, an environment that was vastly different from the chaotic, exposed space of the building site. Craft skill in building declined as a result of the increasing cost of on-the-job teaching opportunities. Modern methods of construction management (e.g. financial instruments like the long-term mortgage, which provided all the funding necessary to complete a project at its outset), the mass-production of materials (especially pre-cut lumber, cement, bricks, iron, and steel), new methods of assembly (e.g. balloon framing), and new delivery systems like the railroads all led to an incredible reduction in the period of time necessary to erect a building of any sort, in addition to supporting the rapid increased in building scale.²²

At the start of the postbellum period, teams of independent subcontractors began to circulate from project to project within large cities like New York, Philadelphia, and Boston, completing one task rapidly and then moving on. Periodicals like Clinton W. Sweet's *Architectural Record*, founded in 1891, helped to facilitate the circulation of these itinerant laborers near the end of the century by making it easier for them to identify projects and tender bids. When the work-rate of the construction industry accelerated, many builders could not afford the expense of on-the-job instruction. By accelerating the rate of production, industrialization eliminated those reflective moments in the working day when instruction occurred, thereby separating work from education.²³ This was yet another reason why apprenticeship became cost-prohibitive.

The disintegration of the apprenticeship system in the United States prompted a variety of responses in the years between 1865 and 1900. Although apprenticeship grew increasingly exploitative and inefficient after midcentury, leading many young people to take on more immediately remunerative jobs in factories, some trade union leaders in Massachusetts, Illinois, New York, Pennsylvania, and Ohio lobbied to strengthen existing apprenticeship laws during the 1860s in the hopes of making the system more appealing. This kind of legislation, like the New York Apprenticeship Law of 1871, restricted skilled immigrant workmen from accessing local labor markets, an attempt to resuscitate declining interest by promising to clarify and enforce terms of indenture.²⁴ Another kind of response, increasingly popular near the turn of the century, was to recreate apprenticeship systems internally, as company training programs for new employees.²⁵ A third response was the foundation of trade and industrial schools and a variety of private educational companies, including evening and industrial schools and a variety of private educational companies, including evening and correspondence schools, that offered vocational training. Extending the spirit of the Cooper Union (established in 1849) and M.I.T., but in an even more vocational direction, Colonel Richard T. Auchmuty founded the country's first trade school in New York in 1881 with

courses in bricklaying, plastering, plumbing, carpentry, house, sign, and fresco painting, stone-cutting, blacksmithing, tailoring, and printing.²⁶ The premise of the trade school as that formalized instruction from trained teachers could serve as a means of accelerating the learning process; an organized curriculum and concentrated instruction were meant to overcome the inherent slowness of acquiring craft knowledge and skills.

The Abstraction of Skill from Work: Reification and Reinvestment

As apprenticeship collapsed, the meaning of skill changed. In the Western intellectual tradition, skill derived from the Greek concept of *technê*. Work was skillful for the ancient Greeks provided that the worker could give an account of his or her actions. Otherwise, the worker simply possessed a “knack,” which the Greeks called *empeiria*, for the task. The philosopher Julia Annas has explains skill’s relation to articulacy as follows: “The skilled person can ‘give an account’ of what he does, which involves being able to explain why he is doing what he is doing. Such a person understands what he is doing, unlike the person who can pick up a knack in a purely unintellectual way, without understanding what it is he is doing and why.”²⁷ Articulacy was an essential characteristic of the skilled worker because unlike those who were innately talented or divinely inspired, skills were transmissible and thus could be improved as arts in time. Skill also seemed to be a distinctly human characteristic; it suggested consciousness and self-reflection, the ability to evaluate a material situation and respond in an appropriate, context-dependent way. The skillful worker was therefore autonomous in the sense of not being beholden to routines or instincts, someone who could respond more freely to material constraints. Fittingly, the etymology of “skill” in Old English, Old Norse, and the Proto-Germanic languages suggests the power to separate material with a tool or to discern mentally in a manner that was metaphorically similar to the actions of a craftsman. Just as the philosopher used reason to chip-away or separate concepts or categories from the rough block of phenomenal existence, so too could the craftsman use his skill to separate the natural world into that which was productive and useful from that which was not.²⁸

This classical notion of skill was central to the material consciousness of the artisan and persisted until around 1870, when no American could ignore the fact that work was changing. The Transcendentalist philosopher Ralph Waldo Emerson wrote in 1864, “Labor: a man coins himself into his labor,--turns his day, his strength, his thought, his affection into some product which remains as the visible sign of his power; and to protect that, to secure that to him, to secure his past self to his future self, is the object of all government.”²⁹ Emerson’s poetic definition of labor was a nostalgic ideal at the time he wrote it. It described an earlier age of artisanal production, not the new industrial reality in factory towns like Lowell, Massachusetts in the mid-1860s. By then, when interest in popularizing drawing through the state education system started to arise in cities like Boston, work no longer resulted in a product that reflected the image of its maker, at least within the expanding manufacturing sector.

As so many of the most prominent Victorian critics of industrial work have pointed out—from Marx and Engels to Ruskin and Morris—the social and technical division of labor in factories and shops tended to simplify, routinize, and intensify tasks in order to increase the rate of production, turning work into the drudgery of wage labor instead of the creative realization of human spirit. Marxist historians and sociologists after Harry Braverman have characterized this transformation as “the degradation of work,” a process that involved the expropriation or alienation of worker knowledge, the loss of autonomy, and either absolute deskilling (the real loss of craft skills) or the polarization of skill between highly-trained managers and a mostly proletarianized working class.³⁰ After industrialization, the definition of skill based on the Greek concept of *technê* no longer made sense. There was clearly a need for new skills, but whether or not these skills were associated with a conscious, articulate maker seemed beside the point.

One of the instruments that Americans used to register how skill was changing in the postbellum period was the census. Just as European nations began to use censuses to track their own domestic and colonial populations to make them more productive, so too did the American government map the occupational landscape of industrialism for the sake of economic development. Francis Amasa Walker, a former army general, the Superintendent of the Ninth and Tenth U.S. Censuses, and the successor to Runkle as the president of M.I.T. (from 1881 to 1897), led these mapping projects. The American census historian Margo Anderson Conk explains that the 1870 Census was the first time that government statisticians, in addition to counting the population to determine Congressional districting, tried to sort the American population according to occupational skill-level.³¹

Sorting the American labor pool depended on the abstraction of skill in theory from the entirety of the work process. Walker began by separating a mass of manual laborers and tradesmen from what he referred to as “prestige” occupations like clergymen, lawyers, and physicians. These were the college-educated professionals, the new middle class of knowledge-workers, who need to be excluded for Walker to establish his system. When counting the mass of manual laborers and tradesmen, Walker continued to apply traditional artisanal categories that associated workers with the products that they made. Hence the persistence of occupational names with the suffix “maker” on the 1870 Census, such as “boot and shoe maker” or “carriage and wagon maker,” even as boots, shoes, carriages, and wagons were increasingly assembled in parts by machine operatives. By 1880, however, fewer makers appeared on the census, as the division of labor continued to dissociate producers from the products that they made. Walker was adamant in the instructions that he gave to his census agents. “The inquiry ‘Profession, Occupation, Trade’ is one of the most important questions of this schedule. Make a study of it,” Walker directed. “Take especial pains to avoid unmeaning terms or such as are too general to convey a definite idea of the occupation... Do not call a man a ‘shoemaker,’ ‘bootmaker,’ unless he makes the entire boot or shoe in a small shop. If he works in (or for) a boot and shoe factory, say so.”³² Instead of using final products and the difficulty or expense of producing them to organize the labor pool, as was the case in the artisanal economy, Walker began to practice of categorizing American workers

into groups according to a generic skill level—the basic unskilled, semi-skilled, and highly-skilled hierarchy that American labor economists still use today.

Walker's two censuses, then, express the abstraction or disembodiment of skill from traditional work patterns and the emerging independence of skill as a category of macroeconomic concern. Only around 1870 did it make sense for industrialists to discuss skill *as such*, as something that could be artificially produced, and to invest in technical education like the 1870 Drawing Act as a means of raising the general skill level of a population, the basic logic if not the full articulation of what is now known as human capital theory.³³ Skill was no longer a demonstration of the material consciousness of the worker, an articulated relationship between man and the sensuous material world. It was now beginning to be defined as the worker's compatibility within a technological system centered on the use of precision machinery.

Drawing as Control, Drawing as Thought: From the Coordination of Work to the Language Metaphor

When C.O. Thompson, an instructor at the Worcester Technical School, responded to Secretary White's 1869 circular letter soliciting advice from drawing experts like Ware, he emphasized the need for greater efficiency. "The great bane of foremen in machine shops is the inability of nine-tenths of their workmen to read a working drawing so as to work from it."³⁴ Sharing the same motivation as the Scientific Management movement of the 1880s and 1890s, but without the novel measurement techniques that Frederick Winslow Taylor and Frank Gilbreth devised, Thompson continued, "it is calculated that the productive efficiency of every machine shop would be increased *thirty-three percent*, if every journeyman could read any common working drawing and work by it. Their present inability to do this leads to working by 'rule of thumb,'—that is, to poor work."³⁵ The journeymen to which Thompson referred likely completed poor work because they lacked the right skills. Either they possessed skills that had been rendered technologically obsolete or they had never acquired skills in the first place. Furthermore, although Thompson makes no mention of it, his intense interest in improving work through drawings was related to the overwhelming presence of immigrants in the Massachusetts workforce, laborers who supported the state's industrial development but sometimes struggled to follow written instructions. "Illiteracy in the post-Civil War period," Marvin Lazerson has written in his history of schooling in Massachusetts, "was preeminently an immigration problem."³⁶ Hence the compensatory nature of technical drawings; they helped Anglophone managers direct immigrant workers in the absence of other means of communication.

Concerns for efficiency in the 1870s were part of the shift from the material consciousness of the craft worker to the new values of precision. Louis Bail, a graduate of the Royal Academy of Fine Arts in Munich who became professor of mechanical drafting at the Sheffield Scientific School at Yale College, echoed Thompson in his own response to Secretary White's circular letter:

There is too much guess-work in our mechanical operations, that can only be obviated by such instruction as you propose. A great deal of time and material is wasted in 'cutting and fitting' and making things only 'about right,' when absolute certainty and correctness of plan should have been secured beforehand. There is no form, however, complex, that cannot be indicated by drawing in such a manner than an intelligent workman, who is competent to read or understand drawings, can execute the object represented with absolute certainty. The simple ability to read plans and drawings fits a man for a good position. In fact, the foreman of a shop is often the only man who is able to do this. By leaving our mechanics in this semi-barbarous condition, we lose much money and credit, and lower the intellectual and moral condition of our artisans. The more mind a man brings to bear upon his business, the more respectable and self-respecting he will become.³⁷

Bail's description of the need for "certainty and correctness" in manufacturing expressed a sensibility that had been growing since the antebellum era. His frustration with the trial-and-error of "guess-work" and with anything less than "absolute certainty"; the confusion of a conception "secured beforehand" with the execution of the object; his confidence that "no form, however complex" could escape the representative powers of a practice like descriptive geometry; the invocation of the "semi-barbarous condition" of unskilled workers and the entire philosophy of history, predicated on the direct comparison of man and machine, that this condition presupposed; his continued usage of class identities like "mechanic" and "artisan" when these identities were already becoming obsolete: Bail's diagnostic of the issues that drawing education was to redress suggested a comprehensive analysis, and implicit acceptance, of American society's industrial transformation. The hard lines of mechanical drawing, based on Gaspard Monge's theory of descriptive geometry and standardized units of exact measurement, was how industrial manufacturers would remake the world of work in their own image.³⁸

Like many other education reformers associated with the 1870 Drawing Act, Bail understood drawing as a managerial tool that helped to rationalize industrial work by controlling an object's passage from conception to execution. For drawing to be effective as a managerial tool, however, the technical literacy of workers needed to increase; hence the need for drawing legislation. In a manufacturing environment like the modern factory, technical literacy was determined in relation to machine tooling and the standardized gauges that were necessary for the mass-production of interchangeable parts and fine consumer goods. In this industrial regime, values like correctness and certainty were becoming increasingly important. Metalwork, for example, unlike woodwork, was intolerant, in the engineering-sense of having narrow limits of permissible variation. Once a piece of steel was cast, it was difficult and expensive for workers to change its dimensions. Similarly, the use of standardized parts in manufacturing or building was profitable provided that one could assemble the parts without on-site alteration. According to historian Edward Stevens, in the transition "from skill in hand to skill in the machine," from artisanship to mass production, workers became technically literate once they mastered four notation systems and their related

vocabularies and grammars: alphabetic expression, scientific notation, mathematical notation, and spatial-graphic representation. Spatial-graphic representation meant the ability to produce, read, and work from measured drawings. The free-hand sketches that artisans once used to gesture toward their intentions no longer sufficed.³⁹

Unlike Bail, when Ware responded to Secretary White's circular letter, he did not emphasize the economic benefits that drawing education would yield as a means of producing skilled workers. Instead, Ware used this opportunity to advocate the cause of art educators to explain how and why drawing would lead to academic reform. Drawing, for Ware, was thinking; it was the expression of a practical intelligence that the American education system had traditionally excluded from its purview because of its association with the mechanical arts and the mechanical classes. Indeed, Ware's response to White's letter avoided more utilitarian arguments in order to address how most schools and universities in the state maintained classifications and hierarchies of knowledge that systematically excluded those disciplines, including architecture and engineering, that employed nonverbal notation systems like drawing. In so doing, Ware called on the state to recognize the existence of cognitive diversity within academia and the possibility of a professionalism without letters.

Ware's response pointed toward a more capacious understanding of the liberal arts, one that would close the divide between the worlds of mental and manual labor. "The introduction of Drawing into our school-work would do something to mitigate the evils arising from the exclusively literary character of our public teaching," he wrote. "Anything that brings manual skill again into repute and counteracts the growing disposition to discredit every means of livelihood that does not consist in 'brain-work' merely, is a positive gain to our civilization."⁴⁰ The diminishment of learning as mere "brain-work" was clearly not meant to be flattering; it was tinged with an anti-intellectual streak that Progressive thinkers like Dewey would try to reconcile after the turn of the century.⁴¹ Ware's intention was to demonstrate that the literary was only one of several paths to an intellectual life and that the material consciousness found in the useful arts tradition provided an alternative.

What exactly did Ware mean by the "literary character" of education? It was not a reference to the practice of reading imaginative, aesthetically significant texts, which only began near the end of the century. Around 1870, literature was a capacious category that encompassed the classical curriculum in its entirety, including the traditional subjects of Greek and Latin, mathematics, and moral philosophy, as well as tedious exercises like the daily recitation that were meant to discipline the minds of students. "The literary" was a metonymic shorthand for traditional learning as a whole. In the postbellum period, because of social transformations like secularization and urbanization, support for this classical curriculum quickly eroded and by the 1890s it fell almost completely out of favor.⁴²

Ware's critique of the liberal arts of American education was reinforced by Walter Smith, the lead administrator of the 1870 Drawing Act. Neither Ware nor Smith reduced drawing to technique that programmed workers to fit within an industrial culture of

control. "Drawing is in many respects like a language," Smith wrote, "a visible language, the language of form, having but two letters in its alphabet, the straight line and the curve; in this respect like our own written words, made up of combinations of straight and curved lines,—with this difference, that whilst a word suggests the name and thought, drawing suggests the thing itself."⁴³ Similarly, in Ware's response to Secretary White's circular letter he wrote, "Drawing gives one a new sense and a new language. And not only is its exercise a delightful recreation in itself, but it opens the eye of the mind to the endless beauties of nature and art. It is thus an invaluable element in general education." He supported public drawing instruction because it would help men "to represent, however rudely, things that cannot be well explained by words."⁴⁴ Ware and Smith were developing a dialectical critique of American education. While they rejected the dominance of the literary in order to make room for the technical, they recuperated the idea that drawing was like a language.

The language analogy that Smith and Ware utilized when describing the benefits of drawing instruction would not have seemed unusual for educated Americans. Between 1820 and 1860, the so-called "Art Crusaders" like John Rubens Smith, John Gadsby Chapman, Rembrandt Peale, and John H.B. Latrobe (the eldest son of Benjamin Latrobe, the first self-proclaimed professional architect in the United States), published approximately 145 popular drawing manuals that also asserted that drawing was like a language (FIGURE 12). Like the South Kensington model of art education that Smith introduced to New England schools, these manuals followed a progressive course of study that moved "from simple lines, to geometrical figures, to household objects, to exercises in perspective, to landscape, and, finally, to the human form."⁴⁵ John Rubens Smith, the London-Born, New York-based author of *A Key to the Art of Drawing the Human Figure* (1831), wrote "The various branches of our art [drawing] constitute the universal language to the mechanic, the engineer's handmaid, the bosom friend of the naturalist, the architect's right hand, and the imperishable record of a nation's fame, in pictures and monuments of her deserving sons, as heroes, statesmen, etc."⁴⁶ Through their insistence that any American could learn to see accurately and then draw well, that good draftsmanship was not an attribute of innate artistic genius but the outcome of deliberate practice, the Art Crusaders framed drawing as a democratic art. By analogizing drawing to language, Ware and Smith harkened back to democratic spirit of these Crusaders while also addressing the problem of skill.

Smith and Ware also both believed that drawing instruction was a way for educators to recognize previously unacknowledged strata of intellectual life. In his *Outline of a Course* of 1865, Ware had suggested that architecture might one day become a liberal art. "For the last four hundred years, literature has been the only avenue to a liberal culture: but before the revival of learning architecture served, to a great extent, to fill this office; and it would be hard to find a study now, in the modern re-action against an exclusively literary training, better adapted to the wants of those who wish to try experiments in education."⁴⁷ Smith made a similar appeal in *Art Education, Scholastic and Industrial* (FIGURE 13), a comprehensive study of art education that he published in 1873. In that text, Smith likened the work of the education reformer to that of a miner,

salvaging the economic potential of students that a narrow understanding of the liberal arts laid to waste:

Men's capacities lie buried within them like precious stones in the mine, or minerals on the hillside. The stupid boy at school, to whom tenses and cases are an abomination, and who finally, given up by his teachers, is turned adrift on the world as a lout, may be compared to a waste field showing evidences of unskillful trials to find iron or silver ore, ending in blind mines and abandoned workings. It might have been, that, had a wider range been taken, the mine would have been discovered; the boy would have found the work his hands had to do in the world, and been strengthened to accomplish it; the vein would have been hit, the well tapped; but, unfound, he has to grope his dispirited way through the world, leading a valueless life. In broadening the basis of education by the addition of the elements of science and art to the subjects of instruction in schools, we give opportunities not yet obtainable for reaching the faculties of peculiarly-constituted minds, and place within the reach of all the first steps of many useful careers; and thus we guard against a waste of human power, and a misdirection of human life, and at the same time pave the way for greater intelligence and refinement generally. A child who cannot draw the forms of objects which his eye sees, as readily as he can write or repeat the words his ear hears, is only half educated; for only half of his natural powers have been EDUCED, or brought out. A child who is brought up ignorant of physical laws and the elements of scientific knowledge has to buy his experience at a costly rate in all his after life, often at the price of life itself.⁴⁸

Here, again, is evidence of an alliance between architectural education and industrial drawing reform in the 1870s, or at least their mutual reinforcement of each other's growth. In unifying against literary education's monopoly over liberal culture, both movements worked to legitimate the idea of a visual intelligence at a moment when the "experiments in education" that Ware was hoping for were just about to begin.

In New England, vocational legislation like the 1870 Drawing Act intersected with the beginning of a new era in the history of the American university. In 1869, two years before he spoke at the Fifth Annual A.I.A. Convention in Boston, Charles Eliot published an article in *The Atlantic* entitled "The New Education" that signaled the beginning of the end of the classical curriculum in higher education. In this article, Eliot heeded the calls of industrial reformers by arguing that colleges should, in some general way, prepare students for their industrial future. One of the ways that colleges could do this was to acknowledge that not all students thought similarly—that there were multiple literacies or varieties of intellectual experience—and then to adapt curricula in such a way that acknowledged cognitive diversity and supported what he understood to be "liberty in education."⁴⁹ For Eliot, the exclusive attitudes of conservative academics who ignored this diversity stemmed from the way that they thought about learning and the human mind.

People who think vaguely about the difference between a good college and a good polytechnic school are apt to say that the aim of the college course is to make a rounded man, with all his faculties impartially developed, while it is the express object of a technical course to make a one-sided man, a mere engineer, chemist, or architect. Two truths are suppressed in this form of statement. First, faculties are not given by God impartially, to each round soul a little of each power, as if the soul were a pill, which must contain its due proportion of many various ingredients. To reason about the average human mind as if it were a globe, to be expanded symmetrically from a centre outward, is to be betrayed by a metaphor. A cutting-tool, a drill, or auger would be a juster symbol of the mind. The natural bent and peculiar quality of every boy's mind should be sacredly regarded in his education; the division of mental labor, which is essential in civilized communities in order that knowledge may grow and society improve, demands this regard to the peculiar constitution of each mind, as much as the happiness of the individual most nearly concerned.⁵⁰

The mind was not a “globe,” Eliot claimed, nor was it a little “pill,” and education was much more complicated than a centrifugal process of mind expansion. These metaphors and habituation associations of learning to “rounding” were fallacies that prevented modern Americans from reaping the benefits of the division of labor by reducing different kinds of intelligence to an equivalence. The notion that students were like tools that were “naturally bent” for different ends opened up the possibility that disciplines once categorized as part of the useful arts in the early-nineteenth century might become liberal arts in the new education of the late nineteenth century. Eliot's recognition of cognitive diversity brought the useful arts and the liberal arts into a continuum in a way that he thought avoided the outright instrumentalization of education. “To make a good engineer, chemist, or architect,” he declared, “the only sure way is to make first, or at least simultaneously, an observant, reflecting, and sensible man, whose mind is not only well stored, but well trained also to see, compare, reason, and decide.”⁵¹ This was the same educational philosophy that was evident in Ware's “Outline of a Course.” Both sought to liberalize technical areas of study in order to professionalize them.

Now, it is difficult to know what exactly Ware meant when he claimed that drawing “opens the eye of the mind to the endless beauties of nature and art,” but all of these comparisons of drawing to language that circulated throughout the discourse of the 1870 Drawing Act pointed back to the convoluted intellectual history of visual thinking. In the tradition of Western philosophy, “the eye of the mind” normally referred to Cartesian speculation, a retreat into the self. Speculative philosophers distrusted perception and sensation, which they sometimes referred to as the “eyes of the body,” because they thought that these cognitive processes involved the passive reception of impressions from physical phenomena. Visual impressions, for example, were suspect because they were susceptible to optical illusions produced by perspective, shadow, and color—aspects of the physical world the technical drawing promoted by the 1870 Drawing Act ignored.⁵² In the culture of engineering, “the eye of the mind” refers to the ability of designers and inventors to “bring elements together in new combinations...to

assemble and manipulate in their minds devices that as yet do not exist.”⁵³ As designers and inventors inspect their imaginary objects with their “mind’s eye,” they develop an intuitive sense for rightness or fitness, a tacit knowledge, that informs their design decisions but often resists verbal or mathematical notation. In art and architectural theory, the idea of the “eye of the mind” stretches as far back to 1607, when Federico Zuccaro introduced the term *disegno interno* in his Renaissance treatise *L’idea de’ pittori, scultori e architetti*. For Zuccaro, this internal vision needed to be distinguished from the material execution of a design.⁵⁴ Zuccaro’s theory of *disegno interno* would influence French academicians in the later-seventeenth and eighteenth centuries like Charles Le Brun, who helped to organize the pedagogy of *dessein* that Ware encountered when he visited the École des Beaux-Arts in the 1860s. “One ought to know that there are two sorts of drawing: one which is intellectual or theoretical [*dessein*], the other practical [*dessin*],” Le Brun wrote in 1672. “That the first depends purely on the imagination... That the practical drawing is produced by the intellectual and thus depends on the imagination as well as the hand. The latter, by means of the pencil, gives the form and the proportion, and imitates all the visible things, going so far as to express the passion.”⁵⁵ Whether in philosophy, engineering, or art and architectural theory, reference to “the eye of the mind,” a phantom sense organ, was a way to suggest a figurative mod of thought that relied neither on the written word nor on empirical observation. A drawing of a building plan, for example, presented a spatial proposition for a building that human eyes would never see and that verbal description could only translate into a sequential movement. Ware did not question what the metaphor might actually entail; he simply deployed it in defense of cognitive diversity.

Ware’s invocation of the phrase “the eye of the mind” was in this sense a casual, perhaps unknowing reference to a sincere belief in the legitimacy of visual thought, one that informed his own participation with the 1870 Drawing Act and the connection that he tried to build between the Drawing Act and architectural education. “it is only by such incessant practice of original design, under proper guidance and criticism, that the creative and imaginative faculty can be exercised and developed,” Ware wrote in 1872. “Moreover, it is through the varied manipulations which exercises of this sort exact, that artistic draftsmanship is best acquired. Drawing thus becomes to the student not a mere mechanical exercise of hand and eye, but a means of expression,—a language to convey the architectural idea he has conceived in his mind.”⁵⁶ Statements such as these provide a clear indication that Ware believed in the potential of visual disciplines like architecture to join the liberal arts. It was an old idea, stretching back to the first articulation of *disegno* in the Italian Renaissance, that understanding does not precede graphic articulation but progresses through it. What was new was that in the 1870s, following Eliot’s campaign for a “New Education,” this belief was becoming more widely accepted and institutionally supported by American educators.

Conclusion:

The excitement for drawing as the most democratic solution to the industrial crisis of skill subsided by the end of the 1870s, at the outset of the Gilded Age. The drawing

reforms initiated by the 1870 Drawing Act demonstrated only limited success, although they did help to expand educational opportunities in art and design throughout New England. By the end of the 1870s, though, drawing—even drawing well—no longer seemed to be a clear indication of intelligence for some Americans. In his *Talks on Art* of 1879, William Morris Hunt, the renowned painter and the older brother of Richard Morris Hunt, Ware's atelier master, wrote "To draw! What is it to draw? Any idiot who could learn to write could learn to draw! Not to draw well; for that seems to me to require more skill than anything else in the world."⁵⁷ Hunt was not interested in efficient communication; skilled artistry involved something more. "Any one who can make the letter D can learn to draw. Learning to draw is learning the grammar of a language. Anybody can learn the grammar, but whether you have *anything* to say, that is another thing."⁵⁸ For an outspoken artist like Hunt, the fatal flaw of drawing education was precisely the notion that drawing was a skill that one could learn through imitation, line by line, and that it could replace contact with other great artists. "You draw with your brain," Hunt insisted. A representative of the new professional class of fine artists, Hunt believed that if drawing education failed to teach students how to think, if it failed to involve creative acts of consciousness, then it could never move beyond mere technique and was not, in the classical sense of the term, really skillful.⁵⁹ Professional architects followed the same trend as professional fine artists, identifying less and less with industry and the useful arts while turning inwards in their new academic environs to redefine their professional expertise in the 1880s and 1890s in terms history and style.

Endnotes to Chapter Two

¹ American Institute of Architects, ed., “Proceedings of the Fifth Annual Convention of the American Institute of Architects,” in *Proceedings of the ... Annual Convention of the American Institute of Architects* (New York: Committee on Library and Publications of the American Institute of Architects, 1872), 38.

² American Institute of Architects, 52.

³ The conference proceedings did not mention the architecture program at the University of Illinois at Urbana-Champaign, and for good reason. According to Geraniotis, instruction only began in 1870 and the program became an official department under the direction of Nathan Clifford Ricker in 1873. Roula Geraniotis, “The University of Illinois and German Architectural Education,” *Journal of Architectural Education* (1984-) 38, no. 4 (1985): 15–21.

⁴ American Institute of Architects, “Proceedings of the Fifth Annual Convention of the American Institute of Architects,” 55.

⁵ On the beginning of architectural education at Harvard, see Anthony Alofsin, *The Struggle for Modernism: Architecture, Landscape Architecture, and City Planning at Harvard* (New York: W.W. Norton, 2002).

⁶ American Institute of Architects, “Proceedings of the Fifth Annual Convention of the American Institute of Architects,” 57.

⁷ American Institute of Architects, 58.

⁸ American Institute of Architects, 58.

⁹ Karen Sawislak, *Smoldering City: Chicagoans and the Great Fire, 1871-1874* (Chicago: University of Chicago Press, 1995). For an overview of the development of fireproof building practices in this period, see Sara E. Wermiel, *The Fireproof Building: Technology and Public Safety in the Nineteenth-Century American City* (Baltimore: The Johns Hopkins University Press, 2000). For the meaning of the fire to the American public, see John J. Pauly, “The Great Chicago Fire as a National Event,” *American Quarterly* 36, no. 5 (1984): 668–83.

¹⁰ American Institute of Architects, “Proceedings of the Fifth Annual Convention of the American Institute of Architects,” 49.

¹¹ American Institute of Architects, 17.

¹² For a first-hand account of the 1872 Boston Fire, see Russell Herman Conwell, *History of the Great Fire in Boston, November 9 and 10, 1872* (Boston : Philadelphia : San Francisco : Detroit: B.B. Russell ; Quaker-City ; A.L. Bancroft ; R.D.S. Tyler, 1873).

¹³ My interest in new forms of literacy and learning styles in relation to the rise of drawing and architectural education has been informed by the following sources: Mary Ann Stankiewicz, “Between Technology and Literacy,” *JADE International Journal of Art & Design Education* 22, no. 3 (2003): 316–24; Mary Ann Stankiewicz, *Developing Visual Arts Education in the United States: Massachusetts Normal Art School and the Normalization of Creativity*, 2016; Edward Stevens, *The Grammar of the Machine: Technical Literacy and Early Industrial Expansion in the United States* (New Haven: Yale University Press, 1995); Daniel Resnick and Lauren Resnick, “The Nature of Literacy: An Historical Exploration,” *Harvard Educational Review* 47, no. 3 (September 1, 1977): 370–85. “Learning styles” is really a post-1960 term. I use it simply to refer to the pluralistic recognition of cognitive differences that seems to have become more prevalent, at least in some parts of academia, in the latter half of the nineteenth century.

¹⁴ On the history of vocationalism, see Herbert M. Kliebard, *Schooled to Work: Vocationalism and the American Curriculum, 1876-1946*, Reflective History Series (New York: Teachers College Press, 1999); Marvin Lazerson and W. Norton Grubb, *American Education and Vocationalism: A Documentary History, 1870-1970*. (New York: Teachers College Press, Columbia University, 1974).

¹⁵ Mary N. Woods, *From Craft to Profession: The Practice of Architecture in Nineteenth-Century America* (Berkeley: University of California Press, 1999), 8. In suggesting that certain antebellum designers and builders made a conscious decision to identify and organize as *professionals*, Woods places her historical actors within the sociological framework of the “professional project,” which for Larson is the concerted attempt by individual practitioners within one occupational group to monopolize the market for their service and thereby increase their social status and social mobility. Magali Sarfatti Larson, *The Rise of Professionalism: A Sociological Analysis* (Berkeley: University of California Press, 1977).

¹⁶ W. J. Rorabaugh, *The Craft Apprentice: From Franklin to the Machine Age in America* (New York: Oxford University Press, 1986), 4. For an account of the American apprenticeship system before it began to decline, see Carl Bridenbaugh, *The Colonial Craftsman* (New York: Dover Publications, 2011). I have also benefited from reading the following: Gillian Hamilton, "The Decline of Apprenticeship in North America: Evidence From Montreal," *The Journal of Economic History* 60 (February 1, 2008); Bernard Elbaum, "Why Apprenticeship Persisted in Britain But Not in the United States," *The Journal of Economic History* 49, no. 2 (1989): 337–49; Steven L. Kaplan, Cynthia J. Koepp, and Yves Lequin, eds., "Apprenticeship in Nineteenth-Century France: A Continuing Tradition or a Break with the Past?," in *Work in France: Representations, Meaning, Organization, and Practice* (Ithaca: Cornell University Press, 1986), 13–53.

¹⁷ Rorabaugh, *The Craft Apprentice*, 5–14; David Waldstreicher, *Runaway America: Benjamin Franklin, Slavery, and the American Revolution*, First edition (New York, NY: Hill and Wang, 2005).

¹⁸ Robert J. Steinfeld, *The Invention of Free Labor: The Employment Relation in English and American Law and Culture, 1350-1870*, First Edition (Chapel Hill: The University of North Carolina Press, 1991); Eric Foner, *Free Soil, Free Labor, Free Men: The Ideology of the Republican Party before the Civil War* (Oxford; New York: Oxford University Press, 1995). For a provocative comparison of apprenticeship with slavery, both of which were undermined by free labor ideology, see Rorabaugh, *The Craft Apprentice*, 179–80. In his review of Steinfeld, Farley Grubb provides a succinct summary of how employment rights change in this period. He writes: "Because all labor agreements were considered property exchanges, an employee's failure to complete a labor agreement was considered a criminal theft of the employer's labor property. What divided slavery from non-slavery was voluntary consent, not inalienable rights to one's own person. As long as there was voluntary consent, the labor agreement's terms, length, duties, and so on mattered little to its legal enforceability. Legal compulsion to force the employee to honor his agreement was not considered an infringement of the employee's freeborn liberties.

This legal interpretation shifted in the early nineteenth century when courts increasingly refused to invoke criminal sanctions or recognize employer rights of compulsion against employees who refused to complete their labor agreements. Employees became 'free' to unilaterally break their labor agreements with impunity. The labor agreement was no longer viewed as a property exchange, but as a covenant, the employer could sue for compensatory damages, but could not invoke criminal sanctions to compel the worker to complete the agreement. "Reviewed Work: The Invention of Free Labor: The Employment Relation in English and American Law and Culture, 1350-1870 by Robert J. Steinfeld," *The Journal of Economic History* 53, no. 1 (March 1993): 206.

¹⁹ This paragraph summarizes large themes in nineteenth-century economic history, each of which historians have analyzed in detail and debated. Perhaps the single most concise account of how industrialization undermined apprenticeship in the United States is Bruce Laurie, *Artisans into Workers: Labor in Nineteenth-Century America* (Urbana: University of Illinois Press, 1997). Other classic works in business and economic history the focus on this period include Alfred D. Chandler, *The Visible Hand: The Managerial Revolution in American Business* (Cambridge, Mass: Belknap Press, 1977); David A. Hounshell, *From the American System to Mass Production, 1800-1932: The Development of Manufacturing Technology in the United States*, Studies in Industry and Society 4 (Baltimore: Johns Hopkins University Press, 1984).

²⁰ Rorabaugh, *The Craft Apprentice*, 34–35.

²¹ Edward. Shaw, *The Modern Architect: Or, Every Carpenter His Own Master; Embracing Plans, Elevations, Specifications, Framing, Etc., for Private Houses, Classic Dwellings, Churches, &c. to Which Is Added a New System of Stair-Building* (Boston: Dayton and Wentworth, 1854); James F. O'Gorman, *Edward Shaw of Boston: Antebellum Architect and Author--An Introduction* (Philadelphia, PA: American Philosophical Society, 2016). On the difference between early and late-nineteenth-century approaches to disseminating design information, see Michael J. Crosbie, "From 'Cookbooks' to 'Menus': The Transformation of Architecture Books in Nineteenth-Century America," *Material Culture* 17, no. 1 (1985): 1–23. Crosbie claims that the 1840s was the period in which architectural publications shifted from being production-oriented to consumption-oriented.

²² H. Ward Jandl, ed., *The Technology of Historic American Buildings: Studies of the Materials, Craft Processes, and the Mechanization of Building Construction* (Washington, D.C: The Foundation for Preservation Technology for the Association for Preservation Technology, 1983). Gwendolyn Wright has also described the intensification of building as an outcome of technological change. "The major difference during the 1870s and 1880s was not mechanization per se, but the greatly increased output

and variety. Mechanization of house-building and decorating did not arrive all of a sudden, spurred by a particular fashion or even an ingenious inventor. Devices like lathes and templates had been used in woodworking for generations. But now productivity improved dramatically with new precision equipment. Higher-grade steel blades allowed the steam-powered machines to be used at full speed, without cease, with no danger of metal fatigue. Interchangeable blade and titling tables expanded the possibilities for speed and variety still further in the 1880s. By 1898, the commissioner of labor, Carroll D. Wright, reported that with mechanical saws it now required only four hours to produce irregular forms in wood that would have required 110 hours with hand processes.” Gwendolyn Wright, *Moralism and the Model Home: Domestic Architecture and Cultural Conflict in Chicago, 1873-1913* (Chicago: University of Chicago Press, 1980), 87. Horace Greeley discusses the transformation of lumber, glass, screws, nails, architectural ironwork, saws, and iron in Horace Greeley, *The Great Industries of the United States*, ed. Michael Hudson, *The Neglected American Economists* (New York: Garland Pub., 1974).

²³ The classic account of the intensification of work in industrialism is E. P. Thompson, “Time, Work-Discipline, and Industrial Capitalism,” *Past & Present*, no. 38 (1967): 56–97. For a recent analysis of intensification in nineteenth-century Massachusetts, see Alexander James Field, “Industrialization and Skill Intensity: The Case of Massachusetts,” *The Journal of Human Resources* 15, no. 2 (1980): 149–75. In comparing the industrialized trades to earlier forms of craft labor, I have benefited from reading the following: E. J. Hobsbawm, “The Tramping Artisan,” in *Labouring Men: Studies in the History of Labour* (London: Weidenfeld and Nicolson, 1964), 34–59; William H. Sewell, *Work and Revolution in France: The Language of Labor from the Old Regime to 1848* (Cambridge ; New York: Cambridge University Press, 1980). On the intentional use of duration in pre-modern building in contrast to the accelerated rate of modern construction, see Marvin Trachtenberg, *Building-in-Time: From Giotto to Alberti and Modern Oblivion* (New Haven: Yale University Press, 2010). On Clinton W. Sweet, F.W. Dodge, and the *Architectural Record*, see Andrew M. Shanken, “From the Gospel of Efficiency to Modernism: A History of Sweet’s Catalogue, 1906-1947,” *Design Issues* 21, no. 2 (2005): 28–47.

²⁴ Paul H. Douglas address the various attempts to resuscitate apprenticeship laws in *American Apprenticeship and Industrial Education*, Studies in History, Economics, and Public Law (New York: Columbia University, 1921).

²⁵ For a description of some of these company training programs, see John S. Garner, *The Company Town: Architecture and Society in the Early Industrial Age* (New York: Oxford University Press, 1992); Stanley Buder, *Pullman: An Experiment in Industrial Order and Community Planning, 1880-1930*, Reprint edition edition (New York; London; Toronto: Oxford University Press, 1970); Kliebard, *Schooled to Work*.

²⁶ Douglas, *American Apprenticeship and Industrial Education*, 187.

²⁷ Julia Annas, *Intelligent Virtue* (Oxford; New York: Oxford University Press, 2011), 43. For a useful counterpoint to the articulacy principle, one should consider discussions of tacit knowledge. See Michael Polanyi, *The Tacit Dimension*, Reissue edition (Chicago ; London: University of Chicago Press, 2009); H. M. Collins, *Tacit and Explicit Knowledge* (Chicago ; London: The University of Chicago Press, 2010).

²⁸ T.F. Hoad, “Skill,” in *The Concise Oxford Dictionary of English Etymology*, ed. T. F. Hoad (Oxford University Press, 2003). On discernment and the “material consciousness” of craft labor, see Richard Sennett, *The Craftsman*, First Edition (New Haven: Yale University Press, 2009).

²⁹ Quoted in Daniel T Rodgers, *The Work Ethic in Industrial America: 1850-1920* (Chicago: University Of Chicago Press, 1978), 14.

³⁰ In this framework, the working class separated into a “labor aristocracy” of union-protected tradesmen and a majority of unskilled laborers, sometimes referred to as mere “operatives,” human accessories to the mechanical engines of capital. See Harry Braverman, *Labor and Monopoly Capital: The Degradation of Work in the Twentieth Century* (New York: Monthly Review Press, 1975). On the expropriation of craft knowledge from workers, see David F. Noble, *America by Design: Science, Technology, and the Rise of Corporate Capitalism* (Oxford: Oxford University Press, 1979). On the gradual loss of worker autonomy David Montgomery, *The Fall of the House of Labor: The Workplace, the State, and American Labor Activism, 1865-1925* (Cambridge ; New York: Cambridge University Press, 1987). As Paul Attewell, a sociologist of work and education has suggested, whereas the craftsman “decides how to accomplish a particular piece of work, chooses the appropriate tools and procedures, and is self-directed in the work,” the machine operator is “told what to do, is given instructions, tools, or procedures on how to do it, and is overseen by management.” Paul Attewell, “What Is Skill?,” *Work and Occupations* 17, no. 4 (November 1, 1990): 441; Charles More, “Skill and the Survival of Apprenticeship,” in *The Degradation of Work?: Skill, Deskilling, and the Labour Process*, ed. Stephen Wood (London: Hutchinson, 1982), 109–21.

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- ³¹ Margo J. Anderson, *The United States Census and Labor Force Change: A History of Occupation Statistics, 1870-1940*, Studies in American History and Culture 2, no. 11 (Ann Arbor, Michigan: UMI Research Press, 1980); Margo J. Anderson, *The American Census: A Social History*, Second edition (New Haven: Yale University Press, 2015). On the idea of using the census to make populations more productive, see Benedict R. O'G Anderson, "Census, Map, Museum," in *Imagined Communities: Reflections on the Origin and Spread of Nationalism* (London; New York: Verso, 2006), 167–90; Michel Foucault et al., *Security, territory, population: lectures at the Collège de France, 1977-1978* (New York: Picador/Palgrave Macmillan, 2009).
- ³² Francis Amasa Walker, "Report of the Superintendent of Census to the Secretary of Interior," in *Ninth Census of the United States: The Statistics of Population, Vol. 1* (Washington, D.C.: US Census Bureau, 1872), xxi–xlvi.
- ³³ My interest in the advent of vocational schooling and human capital theory has been influenced by historical studies like David Eltis, Frank Lewis, and Kenneth Lee Sokoloff, eds., *Human Capital and Institutions: A Long Run View* (New York: Cambridge University Press, 2009). Claudia Goldin has also written extensively about the development of the American educational system in the nineteenth century in relation to human capital. See Claudia Goldin, "The Human-Capital Century And American Leadership: Virtues Of The Past," *The Journal of Economic History* 61, no. 02 (2001): 263–92.
- ³⁴ Massachusetts Board of Education, "Thirty-Fourth Annual Report of the Board of Education, Together with the Thirty-Fourth Annual Report of the Secretary of the Board (1870)" (Boston, 1871), 178.
- ³⁵ Massachusetts Board of Education, 178.
- ³⁶ Marvin Lazerson, *Origins of the Urban School; Public Education in Massachusetts, 1870-1915*. (Cambridge: Harvard University Press, 1971), 8.
- ³⁷ Massachusetts Board of Education, "Thirty-Fourth Annual Report of the Board of Education, Together with the Thirty-Fourth Annual Report of the Secretary of the Board (1870)," 18.
- ³⁸ Michael Adas, *Machines as the Measure of Men: Science, Technology, and Ideologies of Western Dominance* (Ithaca: Cornell University Press, 1989); M. Norton Wise, ed., *The Values of Precision* (Princeton, N.J: Princeton University Press, 1995). On descriptive geometry and the new "universe of precision" created by French engineers in the eighteenth century, see Antoine Picon, *French Architects and Engineers in the Age of Enlightenment* (Cambridge, England; New York, USA: Cambridge University Press, 1992). Bail, incidentally, was sympathetic to phrenology and published a drawing book in 1859 entitled *The Human Head: A Correct Delineation of the Anatomy, Expressions, Features, Proportions, and Positions of the Head and Face*. Sections include "How to Draw a Caucasian," "How to Draw an African," "How to Draw Sobriety," and "How to Draw a Misanthrope." On the influence of physiognomy on drawing instruction in the mid-nineteenth century, see Elliot Bostwick Davis, "Life Drawing from Ape to Human: Charles Darwin's Theories of Evolution and William Rimmer's Art Anatomy," *Nineteenth-Century Art Worldwide* 2, no. 1 (Spring 2003): 1–18.
- ³⁹ Stevens, *The Grammar of the Machine*. On the idea that technical drawing constituted a "culture of control," see Miriam R. Levin, ed., *Cultures of Control* (Amsterdam : Abingdon: Harwood Academic ; Marston, 2000).
- ⁴⁰ Massachusetts Board of Education, "Thirty-Fourth Annual Report of the Board of Education, Together with the Thirty-Fourth Annual Report of the Secretary of the Board (1870)," 183.
- ⁴¹ Richard Hofstadter, *Anti-Intellectualism in American Life*, 1st edition (New York: Vintage, 1966).
- ⁴² On the term "the literary," see Nancy Glazener, *Literature in the Making: A History of U.S. Literary Culture in the Long Nineteenth Century*, Oxford Studies in American Literary History (New York: Oxford University Press, 2016). On the demise of classical education, see Laurence R. Veysey, *The Emergence of the American University* (Chicago: University of Chicago Press, 1965).
- ⁴³ Walter Smith, "Art Education, and the Teaching of Drawing in Public Schools," *The Massachusetts Teacher* 24, no. 11 (November 1871): 386.
- ⁴⁴ Massachusetts Board of Education, "Thirty-Fourth Annual Report of the Board of Education, Together with the Thirty-Fourth Annual Report of the Secretary of the Board (1870)," 183.
- ⁴⁵ Peter C Marzio, *The Art Crusade: An Analysis of American Drawing Manuals, 1820-1860* (Washington, D.C.: Smithsonian Institution Press, 1976), 3. See also Diana Korzenik, *Drawn to Art: A Nineteenth-Century American Dream* (Hanover, NH: University Press of New England, 1985); Foster Wygant, *Art in American Schools in the Nineteenth Century* (Cincinnati: Interwood Press, 1983).
- ⁴⁶ Marzio, *The Art Crusade*, 3.

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- ⁴⁷ William R. Ware, *An Outline of a Course of Architectural Instruction* (Boston: John Wilson and Sons, 1866), 30.
- ⁴⁸ Walter Smith, *Art Education, Scholastic and Industrial* (Boston: J.R. Osgood and Company, 1872), 8.
- ⁴⁹ Charles Eliot, "Liberty in Education," in Louis Menand, Paul Reitter, and Chad Wellmon, eds., *The Rise of the Research University: A Sourcebook* (Chicago ; London: The University of Chicago Press, 2017), 229–47.
- ⁵⁰ Charles Eliot, "The New Education," *The Atlantic Monthly* 23 (February 1869): 218.
- ⁵¹ Eliot, 218.
- ⁵² Martin Jay, *Downcast Eyes: The Denigration of Vision in Twentieth-Century French Thought* (Berkeley, Calif.: University of California Press, 1993). For a critique of the speculative tradition, see Rudolf Arnheim, *Visual Thinking*. (Berkeley and Los Angeles: University of California Press, 1971).
- ⁵³ Eugene S. Ferguson, "The Mind's Eye: Nonverbal Thought in Technology," *Science* 197, no. 4306 (August 26, 1977): 827–36. See also Thomas G. West, *In the Mind's Eye: Creative Visual Thinkers, Gifted Dyslexics, and the Rise of Visual Technologies*, 2nd ed. edition (Amherst, N.Y: Prometheus Books, 2009).
- ⁵⁴ David Summers, *The Judgment of Sense: Renaissance Naturalism and the Rise of Aesthetics* (Cambridge: Cambridge University Press, 1990).
- ⁵⁵ Jacqueline Lichtenstein, "Disegno," in *Dictionary of Untranslatables: A Philosophical Lexicon*, ed. Barbara Cassin et al. (Princeton: Princeton University Press, February 9, 2014), 226.
- ⁵⁶ Quoted in J. A. Chewning, "William Robert Ware and the Beginnings of Architectural Education in the United States, 1861-1881" (Massachusetts Institute of Technology, 1986), 116–17.
- ⁵⁷ William Morris Hunt, *W. M. Hunt's Talks on Art*, ed. Helen Mary Knowlton, First and Second (Boston: H. O. Houghton, Osgood and company, 1879), 12.
- ⁵⁸ Hunt, 62–63.
- ⁵⁹ On the professionalization of American artists, see Sarah Burns, *Inventing the Modern Artist: Art and Culture in Gilded Age America* (New Haven: Yale University Press, 1999).

Introduction to Part II Architecture as a Liberal Art | Ware's Move to Columbia

In 1881, sixteen years after William Barton Rogers first contacted Ware to create an architecture course at M.I.T., Ware accepted an offer to start a new architecture program in the School of Mines at Columbia College in New York City. The offer came from Frederick Augustus Schermerhorn, a member of Columbia's Board of Trustees, who first proposed adding instruction in architecture to the Columbia curriculum in April of 1879. Inspired by his brother-in-law, Richard T. Auchmuty, who would establish the New York Trade School in 1880, Schermerhorn envisioned a small program grafted onto the School of Mines, which then featured instruction in minerology, civil engineering, metallurgy, geology, paleontology, and chemistry.¹ He hoped that it would provide training in advanced design work for students interested in building, as well as courses in the new, reformist field of sanitary engineering. "With but slight additions," Schermerhorn wrote, referring to the drafting rooms that already existed at the School of Mines, "we might establish a school [of architecture] that would become a credit to our college and to our city and a great benefit to the community."² After unsuccessfully recruiting Richard Morris Hunt, the doyen of the New York architecture world, to take on leadership of the new program in November of 1880, Schermerhorn followed Hunt's recommendation to contact Ware and try to lure him away from his post at Cambridge. Ware accepted the offer and, by 1895, had transformed Schermerhorn's modest vision into a fully independent School of Architecture based on a wholly novel conception of architectural education: liberal study (Figure 14).³ What that novel conception entailed and how Ware tried to realize it is the subject of this middle section of the dissertation.

When Ware left M.I.T. in 1881, the program was established in its reputation for producing competent draftsmen and, to the dismay of some administrators, increasingly committed to prioritizing instruction in design above instruction in construction. Ware's appointment of Eugène Létang in 1872 as studio master had proved decisive. While Ware gave year-long lectures on topics like carpentry and masonry and other instructors gave courses in the rudiments of structural engineering, Létang—known by students to be a taskmaster who upheld exacting standards of draftsmanship—implemented a design curriculum that he borrowed wholesale from the *École des Beaux Arts*. Students learned to analyze and logically compose doors, windows, stairways, courtyards and other elements of a building along the major and minor axes of a general plan (i.e. *partis*), moving as logically as possible from the general plan of the building to ever smaller levels of detail, all while maintaining clarity in their designs through the rigorous control of symmetry and proportion.⁴ One of the great benefits of these compositional exercises was that it required students to produce impressive sets of finished drawings, which a department head like Ware could present to administrators and the professional community at the end of each term as evidence of his department's steady improvement.

Aside from the influence of French design instructors like Létang in American schools of architecture and the persistent attraction of Parisian ateliers on students who could

afford to study abroad, the development of the American art world, fine art museums most of all, also encouraged architecture's slow disciplinary migration in the postbellum period from the world of construction to the art world. Museum patronage was an alternative to the legislative and bureaucratic complications of state funding like the 1870 Drawing Act. Soon after Ware's departure, for example, Theodore Minot Clark, Ware's successor as head of architecture at M.I.T. and the future editor of the *American Architect and Building News*, proposed merging M.I.T.'s Department of Architecture with the School of Drawing and Painting of the Museum of Fine Arts in Boston. Rogers, remaining true to the technological mission of his school, rejected the proposal, but it was nevertheless indicative of growing interest during this period in the reclassification of architecture as a fine art.⁵ Architecture and the building in the United States were drifting apart.

While the architecture program at M.I.T. was by all accounts a success as the first school of architecture in the country, Ware would not try to replicate M.I.T.'s curriculum at Columbia. There were now many more pedagogical models for him to learn from. Having served as the A.I.A.'s Secretary of Education throughout the 1870s, Ware studied and annually assessed a growing spectrum of architecture programs around the country, reporting on their differences and similarities to his colleagues in the A.I.A.'s annual reports, writing as if he was a prospective student. This spectrum included older programs in vocational institutions like the Cooper Union and the Franklin Institute; programs or elective courses that grew out of schools of engineering and the applied sciences, like those at Cornell University, the University of Illinois, the University of Michigan, the College of New Jersey (later to become Princeton University), the University of Pennsylvania, and Washington University; and even new programs associated with the fine arts, such as the architecture degree offered by the College of Fine Arts at Syracuse University.⁶ The field of architectural education circa 1881 was wide open.

Such diversity reflected institutional conditions that were unique to the United States. Unlike Europe, the first generation of American architecture schools were not state sponsored. In France, administrators since the time of Louis XIV in the seventeenth century supported the *École des Beaux Arts* because they needed to produce a cadre of civil servants who could oversee the nation's civic building commissions. The winners of the *École's* Grand Prix competitions received these commissions. Likewise, in technical schools throughout Germany and the *Bauakademie* in Berlin, architecture students prepared to become civil service officials in building and surveying alongside peers in structural engineering, machine engineering (including naval architecture), chemistry, and metallurgy. Unlike in the United States, there was no expectation that students in Germany would immediately seek employment in private practices and then eventually establish their own professional firms.⁷ Without government oversight and a state-system of instruction, American educators like Ware who developed curricula for land-grant universities and private colleges in the late nineteenth century were comparatively free to develop programs suited more specifically to local and institutional conditions. Once it was clear that there was little support for a national school of

architecture, Ware encouraged the local chapters of the A.I.A. to organize schools based on their own regional interests.

The biggest difference between Ware's program at M.I.T. and the program that he would establish at Columbia was their ambitions. At M.I.T., Ware aimed to produce "well-informed and trustworthy draughtsmen," around which he believed "the whole system turns" in professional practice.⁸ At Columbia, Ware's emphasis on constructing a multi-tiered system of architectural production subsided as he turned his attention to how one might encourage the formation of an individual professional. The difference in objectives led Ware to reconsider the very nature of his discipline. "The chief difficulty in the study, as well as in the practice, of architecture is its many-sidedness. There is hardly anything which, in theory, an architect should not know," Ware wrote in his first address to Columbia's Board of Trustees. Practitioners might specialize in design or construction, but specialization was inappropriate for educators when there were few schools for students to choose from. What's more, Ware believed that it was un-American. "A school cannot so narrow its range, and although, in fact, the French courses of study are mainly artistic, and the German scientific, and the English practical, they all, from this very fact, fail to furnish the model we should wish to follow."⁹ Ware's declaration of educational independence would not have been controversial in the immediate aftermath of the 1876 Centennial Exposition in Philadelphia, when the American public celebrated native invention with newfound confidence, from the Corliss steam engines and telephones on display in Machinery Hall to Colonial Revival architecture. Later, when George B. Post criticized the technical ability of Columbia's graduates that entered his office, Ware responded with the kind of defensive statement that one continues to hear in exchanges between professional practitioners and collegiate educators. Ware told Post that "the school was not training draftsmen, but furnishing the foundations, and [providing students] with an ability to think clearly and to properly analyze a problem; practical draftsmen are easily and rapidly acquired."¹⁰ From the 1860s to the 1890s, then, there was a fundamental change and expansion in pedagogical ambition. Because Ware now aimed to produce architects instead of draftsmen, he would need to experiment with new methods of instruction.

In Chapters 3 and 4 I describe how Ware's new ambition for architectural education was related to and empowered by the emergence of Columbia as a modern research university. By reframing several problems in nineteenth-century architectural theory within the history of the modern research university, what I want to introduce here is the significance of Ware's invocation of architecture's "many-sidedness," an old, problematic theme in the history of architectural education and one that Ware's contemporaries closely associated with his legacy. At the conceptual nexus of the categories "artistic," "scientific," and "practical," Ware inserted "liberal." Ware did not always use that exact term—sometimes he referred only to "culture" or "taste"—but he repeatedly referenced the idea of liberality from the time he began to work on the curriculum at Columbia until the end of his career and it undergirded not only his theory of architecture and his understanding of what made American architectural practice unique, but also his theory of professionalism more generally. My analysis of Ware's move from Cambridge to New York builds on and further develops previous

assessments of his pedagogy. I argue that this move signaled a turn away from a definition of architecture based on the usefulness of technology to a definition of the discipline constructed around liberal ideas and the early development of the modern liberal arts tradition. We can only understand Ware's liberalism by expanding the circle of analysis beyond Ware's immediate architectural interests and considering how his thought was informed by traditions of liberal analysis and reform.¹¹

Culture, Modernity, Authority

Liberalizing the discipline of architecture had been one of Ware's goals since the beginning of his career as an educator. In a key passage of his 1865 *Outline of a Course of Architectural Instruction*, delivered to both the Society of Arts of the Massachusetts Institute of Technology and a New York congregation of the American Institute of Architects, Ware described liberality as an "intermediate region" within an epistemological hierarchy of the arts and sciences.

Both writing and building range all the way from mere work of necessity, the satisfaction of everyday requirements, up to the pure expression of abstract sentiment, where the form, not the function, is all in all. Upon this lofty level, this Parnassian height, the home of genius, literature and architecture become poetical; they are transfigured, and mingle on equal terms with painting, sculpture, and music. But they differ from the other fine arts, and they differ from the merely useful arts, in this, that there is in each an intermediate region, above the reign of mere utility, though still mainly utilitarian; and below the realm of poetry, though still thoroughly artistic. This middle ground is in literature the field of liberal education, and in architecture the field that we propose to occupy. It is the region of good sense and good taste, of knowledge and skill, of intelligence and refinement, and of talent, perhaps, rather than genius. The fruit of its cultivation is in literature a prose style, clear, graceful, and intellectual; and a style in building simple, elegant, and rational, suited to the best requirements of every-day life.¹²

What was historically notable in this passage was not Ware's reliance on the aesthetic dichotomies of beauty and utility, genius and learning, and form and function. Those were commonplaces in Victorian thought, and derived from classical distinctions that continued to inform Romantic notions of cultural production.¹³ Even the comparison of architecture to literature, a rhetorical ploy used to elevate the status of architecture within the modern system of the arts, had antecedents in the Renaissance *paragone* between painting and sculpture.

What was novel in Ware's conceptual mapping was the linkage that Ware suggested between liberal education and the cultivation of "a prose style," a phrase with a more particular meaning than it holds today. Prose in the nineteenth century denoted an elevated but accessible stratum of cultural life in late-eighteenth and early-nineteenth century Europe that was public, intellectual, argumentative, and supported by learned

societies and new forms of print media like monthly and quarterly reviews. To participate in the world of prose required new kinds of critical literacies, especially the ability to independently judge the works of others, to categorize by genre, locate new works within canons, and refer broadly to literature, art, sciences, and politics. Essentially, Ware was comparing the professional architect to the literary critic or public intellectual, the kind of figure like Carlyle, Emerson, or Margaret Fuller that he would have read or encountered as a young man growing up in a learned, upper-middle-class New England family.¹⁴ Both the critic and the professional architect that Ware envisioned in the mid-1860s shared a set of liberal values that included tolerance for diverse thought or expression, the importance of deliberation with restraint, and the development of individual freedom over and above submission to the external laws of state or academic authority. It was significant that Ware referred to “a prose style” in the abstract and not a particular style of architecture, such as the classical or Gothic. The implication was that the so-called “battle of styles” that raged throughout the European architectural community during the 1830s and 1840s was over. The liberally educated architect was not supposed to be a dogmatic classicist or a Gothic polemicist. He was not supposed to be dogmatic or polemical about any style since few people believed anymore that it was possible to prove the validity of any one style based on archaeological evidence. Judiciousness, propriety, “good sense and good taste”: these were the attributes of a new kind of conservative professional temperament that worked in relation to a historical canon. One could be a professional without being right in any fundamentalist sense. The confusion of a plurality of styles became the authority of style.

Not coincidentally, Ware cited the British poet and cultural critic Matthew Arnold multiple times throughout his *Outline of a Course*. First, Ware paraphrased the famous Arnoldian formulation that culture, rather than an external trapping, was an internal process of self-improvement initiated by an encounter with “the best which has been thought and said in the world.”¹⁵ Ware’s architecture school would be “a liberal culture, as far as it went, in every case; and would not cut any one off from future progress, by withholding the beginnings of the best things, however humble his abilities or modest his aspirations.”¹⁶ By “best things,” he undoubtedly meant exposure to the great monuments of European architecture and proven methods of instruction in design. Like the Académie Française, which was responsible for propagating national standards in French language and literature, Ware thought that professional schools of architecture and their graduates were necessary in order to maintain high standards in the building world. On this point, he quoted at length a passage from Arnold’s “The Literary Influence of Academies” (1864):

An institution like the French Academy—an institution owing its existence to a national bent towards the things of the mind, towards culture, towards clearness, correctness, and propriety in thinking and speaking, and in its turn promoting this bent—sets standards in a number of directions, and creates, in all these directions, a force of educated opinion, checking and rebuking those who fall below those standards, or who set them at nought...It is not that there do not exist in England, as well as in France, a number of people perfectly well able to

discern what is good in these matters from what is bad, and preferring what is good: but they are isolated; they form no powerful body of opinion; they are not strong enough to set a standard, up to which even the journeyman-work of literature must be brought, if it is to be vendible. Ignorance and charlatanism, in work of this kind, are always trying to pass off their wares as excellent, and to cry down criticism as the voice of an insignificant, over-fastidious minority: they easily persuade the multitude that this is so when the minority is scattered about as it is here; not so easily when it is banded together, as in the French Academy.¹⁷

Ware's interest in Arnold and his recourse to "the force of educated opinion" was an indication of his liberal inclinations. On the one hand, he suspected that builders in the United States would never develop real architectural proclivities on their own; on the other hand, he continued to resist state takeover of architectural education as an undemocratic alternative. Instead, Ware hoped that a vocal, self-regulating minority of professional architects in every metropolitan community, like Arnold's academy, would draw the quality of architecture and the building world upwards as a benevolent influence.

His optimism did not prove to be longstanding. Ware's suspicion of popular taste in the mid-1860s would gradually harden over time into a skepticism of the public's ability to differentiate between real and fake professionals, those who practiced good design and those who only decorated building facades in the latest fashions. In 1877, at the Eleventh Annual Convention of the A.I.A., Ware urged his peers to "adopt some method by which incompetent persons, who thrust themselves into the profession, and ignorantly undertake its responsibilities, may be distinguished from architects who have been properly trained and educated for the practice of their art."¹⁸ There were schools of architecture, but not yet a licensing and accreditation system. His desire for such a credentialing system and his frustration with charlatanism reflected the difficulty of maintaining liberal ideals while also accepting the need for social stratification.

As many contemporary commentators have pointed out with respect to Arnold's cultural politics, Ware's call to maintain high standards and to mark those who upheld them with credentials reflected a structural tension in his thinking between the liberalization of architectural education and the conservatism of his underlying model of cultural authority. When Ware spoke of embedding architectural education within the liberal culture of the college or university, it never occurred to him that this institutional support could be an instrument of exclusion, or at least he never addressed this possibility. Culture was not supposed to be a mark of distinction in a society growing more anonymous and complex or a commodity that one traded in as part of one's design services. It was not a thing at all, and surely not the mere application of stylistic formula, but an educational process of virtuous self-development—the inner-directed liberation of an intellectual orientation—that would make professional architects in the United States more than civil servants or technical specialists.¹⁹ Because Ware avoided the inherent tension in the individual-pedagogic meaning of liberal culture and the institutional reality that liberal culture more often than not helped to maintain conservative forms of cultural

authority, he made little attempt at reconciling this tension in his own philosophy of professional education until the end of his career (the subject of Part III in this dissertation). In this sense, Ware's problematic attempt to think beyond vocational training remains at the center of recurring contemporary debates over the liberal education of architects.²⁰

Liberalizing architectural practice was Ware's response to his perception of modernity, which he characterized, first and foremost, in terms of a radical break with the past and a leap into a period of self-conscious development. What one would now call the vernacular approach to building, based on the slow transmission of inherited folk or popular traditions, was irretrievably gone. Commercial interests were too strong in the economy of industrial capitalism for that kind of *natural* history, as the collapse of the American apprenticeship system demonstrated. "Good habits of work," Ware believed, "can hardly grow up in the pressure of practical life."²¹ For this reason, Ware embraced the notion that the self-cultivation or organic development of the architecture student could only take place within the artificial conditions of the school. Like so many other Victorian and early Progressive reformers, the idea of the school became a kind of *deus ex machina*.²² Ware often employed horticultural metaphors to describe the education process, likening the architecture student to a plant in a greenhouse. "In other times," Ware wrote,

the architect grew in his place, as a great tree grows in the wood, the quiet working of natural forces giving just ascendancy to the more vigorous shoots, until some strenuous sapling overtops the rest, and, once in the free air spread his branches and shoots toward the sky. So, out of the rank and file of masons and carvers seem to have sprung the master-builders of all ages, whose works continue to [give] them a nameless fame. But these conditions are not ours. If, now that the whole land is laid waste by cultivation, you would have the trees you want, you must establish nurseries, and plant and water, with all the artificial appliances of sciences and art. If, in modern society, you want architects, you must train them up.²³

The comparison of the architect to the sapling and the school to the greenhouse bespoke a complicated internalization of evolutionary theory, the intellectual paradigm adopted by most progressive Victorian thinkers and some modern architects like Le Corbusier, who savaged conventional architecture schools in the 1920s as "hot-houses where blue hortensias and green chrysanthemums are forced, and where unclean orchids are cultivated."²⁴ Natural selection was once applicable to cultural production, including the history of architecture and the training of architects, but not anymore. The process of educating the modern architect was *willful* and *conscious*; it was more complicated than organic growth, the paradigm of vernacularism. One became a modern architect through a lifetime of study. H. Langford Warren was one of Ware's students at M.I.T. between 1878 and 1879 and later founded the School of Architecture at Harvard on Ware's pedagogical model. In his explanation, where once culture was the fruit of an inherited tradition, now it was necessarily the product of scholarship and devoted study. The modern architect was trapped between the impossibility of

indifference to the past and the inevitability of the past influencing the present. “Our choice lies simply between really knowing it and using it wisely in the fullness of knowledge,” Warren lamented, referring to the history of architecture, “or knowing it only superficially and misusing and misapplying it ignorantly.”²⁵ The only appropriate response for the modern architect in this predicament was to become a student, to try to “combine scholarship with artistic impulse and enthusiasm” and to compress history to a manageable set of principles rather than an overwhelming collection of “outward forms” described in archaeology books. The modern architect, Warren declared:

Studies the art of the great epochs of the past in order to understand if possible those fundamental qualities which made it great, which penetrates to the meaning of the forms used, which analyses and compares for the purpose of gaining inspiration, in order that it may create by following consciously the principles which are seen to have been followed unconsciously in the great art of the past, developing if possible by degrees a tradition out of what is best in all past form, because it understands what to take and what to modify in order to meet the conditions of the present. Such a scholarship, we may hope, will produce an art which will not, on the one hand, change a significant and established form merely for the sake of novelty; but which, on the other, will freely mould and shape form to meet more expressively new and changing conditions.

Ware’s conception of learning determined how he understood the spatial function of the school. The school was an environment that was essential because it provided an atmosphere for students to develop the correct habits of study. Architecture, Ware explained, “requires not only ability and learning, but good habits of work; habits which can hardly grow up in the pressure of practical life, and the formation of which is the peculiar privilege of a school. How to form such habits of thorough study is the chief question, after all: for, without this, success can only be a brilliant failure; and, if this is accomplished, failure in every thing else cannot prevent the School from being a real success.”²⁶ Again, when Ware referred to schools as nurseries and learning as the structuring of the student’s will through habit formation, it is not clear if he did so rigorously, with particular concepts of growth or habituation in mind. Nevertheless, the curriculum that he constructed suggests that habituation was an active process and a key component to the internalization of rationality as a professional ethos. As we will see, to habituate students to the values of architectural professionalism involved the daily repetition of exercises in historical research and design, study and formal response, striking a pedagogical balance between the old character education of the mid-nineteenth century and the disciplinary specialization of the Progressive Era.²⁷

Ware’s emphasis on culture and judgment was not at all unique to the professionalization of architecture. It was bound up in the whole social history of truth and taste in Victorian liberal discourse, including popular and middle-class demands for new kinds of intellectual authority. A remnant of older styles of ethical training and a precursor to the precision instruments and formalized review procedures of physical and social scientists, judgment was the critical, improvisational faculty *par excellence*. As

Daston and Galison have argued in their work on objectivity and informed judgment in nineteenth-century science, to possess judgment and to exercise it under conditions of uncertainty, when the rules did not apply or when there were no rules, qualified an individual for professional standing.²⁸ With the advent of mass society and the communications revolution of the late-nineteenth century, judgment, like concerns over expertise and fake news today, became a cultural watchword. Michael Faraday, the renowned British physicist, claimed in an 1867 address to the Royal Institution and Prince Albert that the “great deficiency in the exercise of the mental powers in every direction” could be summed up in three words: “*deficiency of judgment.*” Faraday continued: “In physical matters multitudes are ready to draw conclusions who have little or no power of judgment in the cases; that the same is true of other departments of knowledge; and that, generally, mankind is willing to leave the faculties which are related to judgment almost entirely uneducated, and their decisions at the mercy of ignorance, prepossessions, the passions, or even accident.”²⁹ Americans would not have endured such an anti-democratic statement in the Age of Jackson, but later in the century, with the proliferation of popular media and a growing market for charlatans, hucksters, and quacks, the nation’s aspiring middle class and corporate elite did whatever they could to support professional judgment.

Later in the twentieth century, after the counter-cultural backlash against expert authority, intellectuals and academics in fields like public administration and behavioral economics would come to harp on judgment as merely another name for intuition and preference, a source of error that reformers should try their best to overcome. Research into the computer automation of architectural work, for example, was intended to overcome the frailty of individual judgment.³⁰ From the 1860s until the 1900s, the beginning and end of Ware’s career as the foremost architectural educator in the United States, the rise of the professions demonstrated a felt need for a society governed by better judgment, demonstrated here by the following two quotations. The first comes from an address by the Unitarian preacher W.H. Furness, the father of the Philadelphia architect Frank Furness, Ware’s office-mate in Hunt’s studio, at the Annual Conference of the American Institute of Architects in 1870. Furness wrote:

The consequence of this confounding of artists with mere mechanics is, that your Art is not only defrauded of its dignity, it is without its rightful authority; and you have incessantly to submit to the humiliation of discussing as questions of taste what are no questions of taste at all, but matters of knowledge, of fact, with persons who, so far from having studied them, have never given a thought to them before--with persons who, if they knew what makes for their salvation, (architecturally speaking,) would sit silently at your feet, and listen and learn. I sympathize with you, gentlemen, as every human man must, when, knowing the reason and principle of your work, you have to hear it questioned and caviled at by those who, sound as their judgment may be in the stock market, or as to the quality of this or that article of commerce, know nothing of Architecture--a trial as great as it would be to a mathematician to hear his axioms disputed, or the sum of two and two, for instance, questioned.³¹

Furness was undoubtedly pandering to his audience, but his belief in the necessary division and public recognition of expert labor remained a talking point for another two decades. The architecture critic Mariana Griswold Van Rensselaer spoke on behalf of the professional class when she proclaimed: “Instead of blaming our architecture for being ‘too professional,’ we should blame it for being not by a thousand degrees professional *enough*—should blame it in that its executives, whatever they have called themselves, have too commonly lacked the knowledge, the training, the cultivated taste, and the educated, refined common sense which in every great building age have been the cornerstones of effort and the inspiration of success.”³²

The Unitarian Origins of Ware’s Liberalism

The most frustrating aspect of Ware’s interest in liberal culture was that despite making constant reference to the inculcation of “good taste” and “common sense,” he never actually defined what these complicated philosophical terms meant, perhaps because they were just part of his lingua franca. His only suggestion was that good taste and common sense were neither inherited nor acquired in the course of social life, but rather the outgrowth of wide-ranging, interdisciplinary study, which university education would make possible. A.D.F. Hamlin, who Ware hired to teach the history of ornament at Columbia in 1883 and who would remain a close confidante thereafter, wrote in an obituary for his mentor,

He was, indeed, the virtual creator of the American system of architectural education, in that those broad features common to all our larger schools of architecture, which distinguish them from the various European schools and systems, rest upon conceptions which he was the first to formulate, and upon methods which he to a large extent initiated...The cultivation of good taste, which as earlier noted, he considered an essential part of the work of the school, he conceived to be impossible without liberal culture; that is, without the study of collateral and outlying subjects, and, as far as possible, visual contact with the world’s masterpieces of thought and design. The history of architecture was especially emphasized and related to history in general; the theory of design as tried as giving outlooks upon psychology, esthetics, physical science, and all the allied arts.³³

C. Howard Walker, a Boston architect who lectured on the philosophy of fine arts at M.I.T. from 1883 until 1930, described Ware’s legacy similarly. Architecture, to Ware, was

an all-embracing art which held intimate communion with painting, sculpture, music and literature, with history, poetry, and the *belles lettres*. He considered that ‘next to a university education, the most liberal education was that of architecture.’ By his own example, and by a delightful subtle indirectness he led many to eclectic study who would otherwise have walked the straight and narrow path of a walled-in specialty.³⁴

Hamlin and Walker testified to the generalist strain in Ware's thinking, one that was longstanding in the history of architecture. Vitruvius in *De architectura* (40 C.E.), basing the education of the Roman architect on the Greek encyclical concept of *paideia*, had stated "Let him [the architect] be educated, skillful with the pencil, instructed in geometry, know much history, have followed the philosophers with attention, understand music, have some knowledge of medicine, know the opinions of the jurists, and be acquainted with astronomy and the theory of the heavens."³⁵ Alberti, of course, had also insisted that architects, given their knowledge geometry and linear perspective, practiced a liberal art.³⁶ The origin of Ware's thinking about architecture, liberal culture, and the ideal professional, however, was less distant than antiquity and the Italian Renaissance.³⁷

It derived from his religious upbringing. Ware's father, Henry Ware Jr. (FIGURE 15), and his paternal grandfather, Henry Ware Sr. (FIGURE 16), were prominent leaders of Boston's Unitarian community. Unitarianism was a type of Protestant reformism that rejected the theological doctrines of the Trinity and the Divinity of Christ. In the United States, Unitarian sects developed out of Congregationalist communities in late-eighteenth-century New England and became a movement associated in later decades with rationalism, the embrace of science, the promotion of abolitionism, and acknowledging the validity of other religions. Unitarians were "liberals" with respect to their tolerance for religious heterodox views, which some scholars have linked to their pursuit of commercial success.³⁸ In comparison to their Calvinist peers, who thought of the Unitarians as heretics, Unitarianism was an "internalist" denomination; hence, they approached the bible more as a guide than as a source of fundamental truth. Unitarians emphasized the believer's freedom of individual conscience and the right to interpretation above necessary confessions of faith and acceptance of creed. They were also enthusiastic about artistic expression and popular education (Unitarians were some of the most vocal supporters of the 1870 Massachusetts Drawing Act). In 1805, Harvard appointed Ware Sr. to the Hollis Professorship of Divinity, setting off a thirty-year controversy between a wealthier group of liberal Unitarians in and around Boston and the conservative clerics of rural New England who wanted to maintain the Calvinist doctrines of their Puritan ancestors. In 1817, Ware Jr. became the minister of the Unitarian Second Church in Boston, where he stayed for thirteen years until he became pastor of Harvard Divinity School. Ralph Waldo Emerson, Ware Jr.'s protégé, replaced him at Second Church. William Ware, Ware Jr.'s younger brother and William Robert Ware's uncle, was a pioneering Unitarian minister in New York, the counterpart to William Henry Furness's pioneering work in Philadelphia. William Robert Ware, in short, like Frank Furness in Philadelphia, grew up immersed in a Unitarian world and internalized its values.³⁹

Beginning in the 1830s and continuing through the 1880s, the concept of "self-culture" became increasingly prominent in Unitarian thought. Because Unitarians rejected the Calvinist belief that human nature was totally corrupt, their ministers often preached a gospel of human perfectability, encouraging their worshippers to strive for righteous self-improvement. In 1838, William Ellery Channing, the foremost Unitarian preacher in

the United States, delivered a series of lectures in Boston entitled *Self-Culture* (FIGURE 17). “To improve a man, is to liberalize, enlarge him in thought, feeling and purpose,” Channing wrote. “Narrowness of intellect and heart, this is the degradation from which all culture aims to rescue the human being.”⁴⁰ Improvement came about through balancing the powers of “self-searching” and “self-forming.”

We have first the faculty of turning the mind on itself; of recalling its past, and watching its present operations; of learning its various capacities and susceptibilities, what it can do and bear, what it can enjoy and suffer; and of thus learning in general what our nature is, and what it was made for. It is worthy of observation, that we are able to discern not only what we already are, but what we may become, to see in ourselves germs and promises of a growth to which no bounds can be set, to dart beyond what we have actually gained to the idea of perfection as the end of our being. It is by this self-comprehending power that we are distinguished from the brutes, which give no signs of looking into themselves. Without this there could be no self-culture, for we should not know the work to be done; and one reason why self-culture is so little proposed is, that so few penetrate into their own nature... But self-culture is possible, not only because we can enter into and search ourselves. We have a still nobler power, that of acting on, determining and forming ourselves. This is a fearful as well as glorious endowment, for it is the ground of human responsibility. We have the power not only of tracing our powers, but of guiding and impelling them, not only of watching our passions, but of controlling them, not only of seeing our faculties grow, but of applying to them means and influences to aid their growth.⁴¹

Many of these Unitarian preachers were vitalists who believed, like Margaret Fuller, that “the object of life is to grow.”⁴² James Freeman Clarke, a Unitarian preacher who went to Harvard Divinity School with Emerson and W.H. Furness, wrote in *Self-Culture: Physical, Intellectual, Moral, and Spiritual* (1880) that “God has placed us here to grow, just as he placed the trees and flowers. The trees and the flowers grow unconsciously, and by no effort of their own. Man, too, grows unconsciously, and is educated by circumstances.”⁴³ Clarke then added a crucial caveat, a fundamental difference between man and other organisms. “But he can also control those circumstances, and direct the course of his life. He can educate himself; he can, by effort and thought, acquire knowledge, become accomplished, refine and purify his nature, develop his powers, strengthen his character. And because he *can* do this, he ought to do it.”⁴⁴ The Unitarian gospel of growth shaped the most basic aspects of Ware’s architectural pedagogy, as well as his commitment to teaching and faith in study.

Unitarian preachers in the antebellum period like Channing and Unitarian preachers in the postbellum period like Clarke agreed that the best way to promote self-culture was to read books. Their pedagogical values were intensely literary. Channing saw books as “the true levelers,” “silent teachers,” which provided readers with an opportunity to “intercourse with superior minds.”⁴⁵ “Instead of depending on casual rumor and loose conversation for most of their knowledge and objects of thought; instead of forming their judgments in crowds, and receiving their chief excitement from the voice of neighbors,

men are now learning to study and reflect alone, to follow out subjects continuously, to determine for themselves what shall engage their minds, and to call to their aid the knowledge, original views, and reasonings of men of all countries and ages," Channing declared. "The results must be, a deliberateness and independent of judgment, and a thoroughness and extent of information, unknown in former times."⁴⁶

What one read, however, made a difference. Clarke feared that the public's appetite for newspapers was destructive of self-culture. "When we read [the newspaper], it is not to find what is true, what is important, what we must consider and reflect upon, what we must carry away and remember, but what is new."⁴⁷ Still, Clarke, like other bibliophiles, had faith in what he considered "good" literature. "To read two or three good books on any subject," he claimed, "is equivalent to hearing it discussed by an assembly of wise, able, and impartial experts, who tell you all that can be known about it. You see the whole field, understand all that can be said on one side or the other, know what has been the result in practice of either course. The experience of the whole world, and of all past history, comes to your aid."⁴⁸ Through Ware, Unitarian interests in self-culture and reading as a technique for the development of individual judgment entered American architectural culture. Some American architects had, of course, been book collectors, but the centrality of reading and study to architectural education was a consequence of Ware.⁴⁹

The influence of Unitarianism on American architectural culture, however, was double-edged. While it supported the scholarly artistic values of Ware and other institution builders, it also led to Transcendentalism, which influenced, in turn, the design philosophies of Louis Sullivan and Frank Lloyd Wright.⁵⁰ Sullivan's *Autobiography of an Idea* has perhaps done the most damage to our understanding of Ware, since it may have encouraged others to dismiss Ware as quickly as Frank Furness who, upon hearing that Sullivan had attended Ware's program at M.I.T., went into a fit of rage. Furness also grew up in a prominent Unitarian family, but unlike Ware, preferred the "real life" and the bloody crucible of experience (Furness was proud of having enlisted in the Civil War) to the contemplative, emasculating environs of higher education. "This answer," Sullivan wrote, "was the detonator that set off the mine which blew up in fragments all the schools in the land and scattered the professors headless and limbless to the four quarters of earth and hell. Louis, he said, was a fool. He said Louis was an idiot to have wasted his time in a place where one was filled with sawdust, like a doll, and became a prig, a snob, and an ass."⁵¹ Sullivan's encounter with both Ware and Furness marks a crossroads in the history of architectural education, a point where education and practice, theory and experience, separated. Ware came to epitomize the institutional path into the collegiate system that exists today; Furness represents a path foreclosed after the turn of the century. In the next two chapters I will follow Ware's path into the university.

Toward the University: Separating Education from Practice

Although I will not emphasize the wider social history of architecture surrounding Ware's move to Columbia, some understanding of the context for Ware's interest in liberalism is necessary. New York City in 1881 had rebounded from the Panic of 1873 and was leaping into a period of metropolitan expansion. By 1880, an ascendant bourgeois elite had consolidated a financial regime based on international credit markets, mass migratory labor, transoceanic communication and shipping, continental rail and telegraph networks, and the constant churn of the local real estate market.⁵² Managers and corporate employees oversaw the day-to-day operations of this bourgeois elite's business enterprises. All of the basic technological components of high-density urbanization were in place, including the steam (or hydraulic) elevator, the telephone, an electricity grid, and an elevated railway system for rapid transit. Workers completed George B. Post's Western Union Telegraph Building in 1875, the same year that Richard Morris Hunt's Tribune Building was completed—two predecessors of the skyscraper. In 1884, 21 of P.T. Barnum's circus elephants crossed Roebling's Brooklyn Bridge as a publicity-savvy demonstration of the suspension system's structural stability. The French Second Empire style, for many onlookers in the 1870s an indication of the city's cosmopolitanism, had reached its crest and steadily declined over the next thirty years. James H. Giles's Lord and Taylor Building, the great palace of fashion and consumption, opened in 1870; J. William Schickel's Staats-Zeitung Building opened in 1873; and Alfred B. Mullett's gargantuan City Hall Post Office opened in 1880.⁵³ Lastly, control of the city had shifted from Knickerbocker patricians to Tammany Hall machine politicians to a leadership split between "civic-minded capitalists" and a "cultural gentry" of proto-Progressive reformers, with whom Ware would personally identify.⁵⁴

The liberalization of architectural education required a clear separation of education from practice. Although Ware continued to accept "special students" in his program, students who studied while also working in firms and stayed in school for only a year or less, he did so only because he invited their positive, workmanlike influence on the undergraduates, many of whom came from middle- and upper-class families. So as to forestall charges of elitism, Ware worked near the end of his career to democratize architectural education extracurricularly, through the International Correspondence School. These efforts are the topic of the final section of the dissertation. Nevertheless, as the collegiate system of architectural education grew in the United States, non-academic routes to professionalism closed down, a transition that historians have also identified in the history of other professional fields, such as law and medicine.⁵⁵ Although conformity to academic standards would cost American architects uncompromised control over their own system of education, it would gain them the social status that most of them lacked and an apparatus that most of them could not afford.

As late as 1874, Ware questioned the relative merits of architectural education in a school versus an office and recognized that "there is much, even in design, that cannot be taught in a school."⁵⁶ Collegiate schools of architecture were "supplemental," akin to finishing schools. For Ware, they provided aspiring architects only

a certain measure of scientific attainment, adjusted to the needs of the profession; a superior draughtsmanship; a knowledge of the history of styles, and such an acquaintance with theoretical discussions of which they have been made the subject as shall be a protection from further theorizers; a large experience in the higher paths of design, refining the taste and ennobling the imagination; and the habit of regarding the whole subject in a large and simple, that is, in the artistic point of view—this, which life in an office seldom offers, and which it is not the business of an office to offer, schools are instituted expressly to afford. With the appliances now at hand, they can be as easily afforded in this country as abroad.⁵⁷

By 1880, Ware no longer questioned the merits of schooling. The training of architecture students in “office schools” and independent ateliers, such as those of Richard Upjohn and Richard Morris Hunt, was insignificant compared to university programs.⁵⁸ The academicization of professional education had quickly run its course, leaving architectural education in the United States, like other fields of professional education, trapped within the “structural ambiguity” of preparing students to become future practitioners and the persistent need of the discipline to demonstrate its academic *bona fides*.⁵⁹

Arguments and Theories: Producing a Disciplinary Subject

Chapter 3 focuses on the problem of disciplinary legitimation. I argue that Ware’s liberal course in architectural education was meant to demonstrate to administrators and colleagues in other academic disciplines that architecture conformed both to the university’s culture of professionalism and to its culture of classicism. Given that the capacity for judgment was the distinguishing attribute of the professional, Ware’s objective was to produce a subject whose work was *critical*, based on reasoned process of decision-making and information management. Whereas the builder possessed a tacit knowledge of construction from an immersion in vernacular tradition and the technician possessed an explicit knowledge of construction science through mathematics, the professional architect, according to Ware, structured design proposals in relation to a growing catalog of historical precedent, inducting the forms of the past to help shape the present. Historicism was therefore integral to the process of transforming architecture into a liberal profession.

For Ware, the use of historical precedent rationalized architectural practice without recourse to universal laws. To design in relation to historical precedent required that the architect accumulate relevant historical information through a research process, evaluate this information, and provide some sort of rationale (i.e. an argument) that responded to research with a design proposal. This procedure rejected the archaeological emphasis on correctness and the artistic emphasis on creative originality in favor of a more jurisprudential procedure of selecting similar cases from within the history of architecture and comparing them based on analogous conditions or shared

principles. Ware's historicism, in other words, was meant to lead not to an architecture of objective fact or individual inspiration but to an architecture of choice and discretion, one that preserved disciplinary traditions while allowing for innovation.

Chapter 3 presumes some familiarity with eclecticism as a major, controversial theme in nineteenth century architectural history and theory, especially in Britain and the United States. The meaning of eclecticism has always been vague; it has signified many different things to many different people. Etymologically, the word comes from the Greek *eklegion*, meaning "to choose." Eclectic philosophers or religious leaders were those who chose what they thought were the best elements of different philosophical or theological systems and tried to combine them. Modern usage of the term derives mostly from the French philosopher Victor Cousin (1792-1867). Cousin believed that the Enlightenment required the rejection of all forms of prejudice and authoritarianism, whether political or intellectual. It was the responsibility of the individual to search for truth using only one's native powers of reason as a guide. A secularist, Cousin also believed that all that there was to know in the world was already in the world; one need not await divine revelation. Eclectic philosophers could discover the truth through a process of elimination, identifying the contradictions within different philosophical systems (including the systems of natural philosophy) and combining the elements that did not contradict into a single, unified system.

In architecture, eclecticism grew out of a growing recognition among theorists-practitioners in the 1850s and afterwards that stylistic debates over neo-classicism and Gothicism were futile and revivalism too constricting. It worked somewhat similarly to philosophical eclecticism: eclectic architects like Cesar-Denis Daly in France and A.J.B. Hope in England looked to emphasize what the neo-classical and Gothic systems shared instead of what was mutually exclusive. This mentality led some architects to experiment with transitional styles, such as the Elizabethan, Jacobean, Second Empire, and Queen Anne styles, as well as exotic styles from India and the Middle East. The basic idea behind eclecticism was that architectural progress proceeded through individual acts of selection and combination. The eclectic generation differed from their predecessors, the revivalists, in that the latter group believed that the only choice was between truth and falsehood. They differed from their successors, twentieth-century modernists, in that the backward-facing orientation of eclecticism conceived of the present in terms of the past instead of the future. Eclecticism was mindless imitation of history, at best, or the irrational escape into decorative make-believe, at worst.⁶⁰

What is undeniable about the eclecticism that emerged in nineteenth-century architecture, however, is that it transcended the question of style. Meeks has referred to "creative eclecticism"; Wilson to "scientific eclecticism"; Longstreth to "academic eclecticism."⁶¹ Instead of debating the descriptive value of each of these qualifiers, what I want to emphasize is that eclecticism was, above all, an *organizational* phenomenon. It referred more or less directly to the rapid accumulation and circulation of architectural information throughout the nineteenth century, mostly a consequence of the expansion and cheapening of print media, but also because of archaeological investigation around the world and the new "exhibitionary complex" of world fair's, galleries, and museums.⁶²

For professional architects, the challenge posed by this advanced stage of eclecticism was how to ensure that the accumulation of architectural information supported rather than undermined their authority. If in the first half of the nineteenth century eclecticism was a stylistic dilemma related to nationalist ambitions, by the mid-1870s it became a symptom of information anxiety, the sublime terror of knowing that there is too much for an individual practitioner to know.⁶³

To quell this anxiety required some sort of order. Revivalists like Pugin implied as much when they spoke early in the century of “a Babel of confusion” and “the carnival of architecture,” a world turned upside down by sheer variety.⁶⁴ The order could be spatial and curatorial, as in Soane’s house-museum (begun in 1809), John Foulston’s eclectic series of buildings on Ker Street, Devonport, or George Whitwick’s proposal for an Epcot-like pleasure garden in *The Palace of Architecture* (1840; FIGURE 18), where visitors would perambulate through the history of architecture. It could be graphic, as in Joseph Gandy’s phantasmagoric chart “Comparative Architecture” (1836), Thomas Cole’s painting *The Architect’s Dream* (1840; FIGURE 19), and C.R. Cockerell’s drawing *The Professor’s Dream* (1848; FIGURE 20). Or that order could be formal, as in the imposition of a retrograde beaux-arts classicism by American architecture’s professional elite at the 1893 Columbian Exposition in Chicago. That, in fact, is David Brain’s interpretation of how the architects associated with the American Renaissance like McKim Mead and White overcame eclecticism and restored a sense of order to the built environment at the end of the nineteenth century. They used classical form as a “rhetoric of style” to discipline (i.e. suppress or control) alternative modes of practice and thereby establish institutional hegemony over the field of architectural practice.⁶⁵

There is much in Brain’s argument that I find convincing, especially the connection that he suggests between eclecticism and professionalism, but in the following section I diverge from his account in two notable ways. First, I argue that although eclecticism threatened to undermine professional authority, it also helped to produce it insofar as it encouraged elite designers and architectural educators like Ware to emphasize the centrality of trained judgment to their own professional expertise. However skeptical one might be toward professional claims to special kinds of judgment or heightened taste, they were undoubtedly a vital part of professional ideology and therefore merit the historian’s attention.⁶⁶ Second, I argue that it was not so much classical form that overcame the threat of eclecticism as it was the institutional apparatus of the university, its celebration of scholarly research and its investment in bibliographic infrastructures, that provided an order to modern architectural practice. One simply cannot understand the production of architectural authority in the late nineteenth century without a firm appreciation for the development of the American research university. This was a moment when architectural education, often assumed to perpetually lag behind the profession and feebly attempt to respond to its needs, determined what constituted professional practice.

Chapter 4 describes the key instrument that Ware used to institutionalize his historicist model of architectural education at Columbia: the Avery Architecture Library, which from 1893 until 1915 was under the direction of Edward Robinson Smith. All libraries for

collegiate architecture schools in the United States derive from the Avery Library—if not in design layout than certainly in their special purpose, to produce a liberal practitioner rather than a specialist. These collegiate architecture libraries, which now exist all over the country, are one of the greatest legacies of Ware’s career and his commitment to liberal study. Architectural historians regularly characterize Ware’s course as “studio-based,” at least in comparison to the early architecture programs that aligned with engineering, such as Nathan Clifford Ricker’s department at the University of Illinois.⁶⁷ This assessment is only half right. If Ware’s pedagogy was “studio-based,” it was by no means isolated within the studio. My hope is that by moving from questions of skill and fabrication, pursued in Part I, to questions related to information management, study, and the use of historic precedent, I will be able to highlight some of the more significant issues in architecture’s transition from the useful to the liberal arts and in the transition from the age of eclecticism to the modernism of the twentieth century.

In addition to providing a general description of the Avery Library’s early years, Chapter 4 also focuses closely on two spatial devices, the alcove and the book lift, that ordered the production of the liberal architect in Avery Hall by facilitating the cultural technique of reading. These devices may seem relatively minor, but they provide an opportunity for theoretical reflection. As German media theorists of the 1970s have explained, reading, like the elementary cultural techniques of writing and counting, is not and has never been a natural act.⁶⁸ And as any instructor of an architectural history course knows all too well, it is especially unnatural for most architecture students—but not at all because these students are intellectually deficient or disinterested in the knowledge contained in books. In the apprenticeship system, reading was far less important than the careful observation and mimetic reproduction of the master. It is therefore misleading to compare a media technology like a book to a prosthetic that extends the power of some inherent human capacity (e.g. memory), or to compare the reception or denial of information stored in a media technology like a book to metabolic digestion. A cultural technique like reading, like the effective use of Google search terms or an Instagram feed, requires specific skills, aptitudes, and sensorial adjustments that develop only when users make them part of routines, freeing up cognitive processing power to use the technology with some degree of fluency. In the case of reading an architecture book, the reader must learn, for example, to sit still, to note the structure of the text in addition to its content, to compare images of drawings and buildings with verbal descriptions that exist on the same page. Ware’s historicist vision of using the past as precedent in the design process depended, as it continues to depend, on the material infrastructure of book collecting and the cultural technique of reading. I would hazard to assume that architects read more and in more effective ways than other members of the construction industry, but this is not a topic that has been studied closely, despite the fact that architects in the past believed that reading was a vital source of their professional judgment and helped them internalize the scholarly values of the university.⁶⁹

My interest in reading as a facet of professionalization was inspired by Foucault’s analysis of Flaubert and what he calls “the machinery of dreams,” a reference to an epistemic shift that occurred sometime around 1800 in the literary world. Foucault

believed that around this time, literature moved from an expressivist theory of language, in which words corresponded transparently to the things in the world and the ideas or feelings in an author's head, to a structural theory of language and the imagination, a self-referential, recursive "literary space wholly dependent on the network formed by the books of the past."⁷⁰ On the discovery of this new kind of imagination, Foucault writes:

Flaubert was responding to an experience of the fantastic which was singularly modern and relatively unknown before his time, to the discovery of a new imaginative space in the nineteenth century. This domain of phantasms is no longer the night, the sleep of reason, or the uncertain void that stands before desire, but, on the contrary, wakefulness, untiring attention, zealous erudition, and constant vigilance. Henceforth, the visionary experience arises from the black and white surface of printed signs, from the closed and dusty volume that opens with a flight of forgotten words; fantasies are carefully deployed in the hushed library, with its columns of books, with its titles aligned on shelves to form a tight enclosure, but within confines that also liberate impossible worlds. The imaginary now resides between the book and the lamp. The fantastic is no longer a property of the heart, nor is it found among the incongruities of nature; it evolves from the accuracy of knowledge, and its treasures lie dormant in documents. Dreams are no longer summoned with closed eyes, but in reading; and a true image is now a product of learning: it derives from words spoken in the past, exact recensions, the amassing of minute facts, monuments reduced to infinitesimal fragments, and the reproductions of reproductions. In the modern experience, these elements contain the power of the impossible. Only the assiduous clamor created by repetition can transmit to us what only happened once. The imaginary is not formed in opposition to reality as its denial or compensation; it grows among signs, from book to book, in the interstice of repetitions and commentaries; it is born and takes shape in the interval between books. It is a phenomenon of the library.⁷¹

Like much of Foucault's work, this is a slippery passage that needs to be read carefully. What interests me is the idea that modern disciplinarity, in architecture and other creative fields like painting and literature, is an effect of media technologies and institutional resources while modern creativity is, to borrow the words of literary scholar Andrew Piper, more "an act of intermedial making" than the Romantic expression of an inner vision. My account of the influence of classical philology on Ware and his fellow architect-historians stems from this idea that the will to descriptive exactitude, closely associated with philology, can form rather than foreclose a modern imagination. Likewise, I interpret the alcoves of the library and the electrical booklifts that McKim installed in Avery Hall as interfaces that were meant to link Ware's students to the entire history of architecture. In connecting the studio to the library—but also maintaining their division—these interfaces were minor but critical devices in transmitting architectural authority from the collective or corporate subject of the discipline to the individual practitioner, which the whole ideology of professionalism presumes. One learns to become an architect by learning about and responding to other architects, by living, as it were, in a self-enclosed world of architecture. And one learns to design by learning

about other designs, in constructing analogies that connect the past to the present and by imaginatively inhabiting the perspective of one's forbearers. These pedagogical maxims related to the immersion of a student in a discipline seem almost banal today but they only became possible once pedagogues like Ware, backed by the power of a university like Columbia, developed a curriculum that habituated students to a referential *modus operandi*. Ware did not want his students to imitate the forms of the past or to submit to tradition; he wanted them to practice throughout their careers with the idea of architecture as their conscious theme.

Two social theorists have influenced my focus on the collegiate architecture student as a liberal subject: Michel Foucault and Norbert Elias. Without going into unnecessary detail, their contributions warrant brief explanation. Foucault's description of the prison as a disciplinary apparatus and the inward turn of panopticism, understood as a stage in the process of subject formation as well as a means of self-surveillance, is roughly analogous to my description of the architecture school program that Ware established at Columbia. *Mutatis mutandis*, we can think of the workings of the architecture library in terms of the productive power of confession, the former being predominantly spatial and the latter a predominantly social technique.⁷² Second, from Elias's theory of the civilizing process I have borrowed the term "psychologization" to describe in Chapter 4 the process by which the collegiate architecture student developed, at least in theory, a structural sense of interiority and imagination, without lapsing back into Romantic notions of creativity.⁷³ To some extent, then, my interest in how the architecture library contributed to the process of individualization and equipped the student with the capacity for trained judgment stems from both Foucault and Elias; the processes of discipline and psychologization are complementary. The former works on the body as a routine and a posture; the latter on the mind as a sensibility.

Incorporating these theories of subject formation into my account of the liberal study of architecture has helped me resist the notion that architectural expertise, like other kinds of professional expertise, is only a consequence of jurisdictional conflicts over epistemic territories, which allows victorious groups to control how problems in that territory are defined and addressed through mechanisms of social closure, such as registration and licensing exams. This explanation remains prevalent within the sociology of the professions and within the history of architectural education, especially those histories that define architecture only in relation to a neighboring discipline like engineering or the fine arts.⁷⁴ As several contemporary sociologists have noted, including Gil Eyal, this jurisdictional model of explanation can be problematic.⁷⁵ Aside from the fact that it presupposes the existence of epistemic territories *a priori*, as if they were stable landmasses over which groups could erect different professional borders, the jurisdictional model is limited for two reasons. First, because of its negative logic, it can only define one kind of disciplinary expertise as the negation of other possible kinds of disciplinary expertise. Architects and planners, for instance, compete to control what kinds of knowledge determine the design of cities, precluding the possibility of a synergistic relationship that strengthens the expertise of both professional groups. Second, to analogize professional expertise to a landmass is to wish for a degree of stability that may have never existed. In the case of American architecture, to assume that the

profession relied floating foundation built on the shifting quicksands of art, technology, and liberal democracy is just as helpful as to assume the existence of epistemic territories.

While I aim to follow Eyal in deterritorializing expertise as “a network connecting together actors, devices, concepts and institutional and spatial arrangements,” my account is complementary rather than identical to his own.⁷⁶ Eyal, taking critical inspiration from Actor-Network Theory, focuses on “the arrangements and conditions necessary for problems to become objects of expert labor”; it is therefore a model of objectification in which all elements of the network link together on a flat plane.⁷⁷ As mentioned above, my interest is in the arrangements and conditions that allowed the collegiate student of architecture at Columbia to present himself as an object of pedagogical labor and self-cultivation. It is therefore a model of subjectivization—“a process of becoming more subjective,” in the words of Foucault—that tries to account for psychic depth.⁷⁸ This was a substantial identity—the architecture was an institutional if also a discursive construct—and it involved labor that was meant to produce a real difference: a subject with the capacity to make judgments that non-professionals supposedly did not possess. What follows, then, is an account of an ideal disciplinary subject and pedagogical attempts at its realization.

Introduction to Part II: Endnotes

¹ Robert McCaughey, *A Lever Long Enough: A History of Columbia's School of Engineering and Applied Science Since 1864* (New York: Columbia University Press, 2014). The largest portion of mining students was hired by corporations based in New York and sent to the American West after graduation to construct deep-shaft, hard-rock mines and to professionally manage the supply of industrial raw materials like copper and oil. Those students who developed an interest in architecture likely did so after taking courses in drafting and descriptive geometry that were meant to enable them to map subterranean spaces and detail machine parts. The curriculum for the School of Mines was assembled in an ad-hoc manner; it was not based on the European polytechnic.

² J. A. Chewning, "William Robert Ware and the Beginnings of Architectural Education in the United States, 1861-1881" (Massachusetts Institute of Technology, 1986), 146.

³ For an in-depth description of Ware's move from M.I.T. to Columbia, including a comparison between the two programs, see Chewning, 144–81.

⁴ There are many descriptions of the École system of instruction that Létang introduced at M.I.T. See Arthur Drexler et al., *The Architecture of the École Des Beaux-Arts* (New York; Cambridge, Mass.: Museum of Modern Art; Distributed by MIT Press, 1977); Jean Paul Carlhian, "The Ecole Des Beaux-Arts: Modes and Manners," *JAE* 33, no. 2 (1979): 7–17; Jean Paul Carlhian and Margot M. Ellis, *Americans in Paris: Foundations of America's Architectural Gilded Age* (New York: Rizzoli, 2014); David Van Zanten, "What American Architects Learned in Paris, 1845-1914," in *Nineteenth-Century Architecture: Volume III*, ed. Martin Bressani and Christina Contandriopoulos, vol. 3, 4 vols., *Companions to the History of Architecture* (Chichester, West Sussex; Malden, MA: Wiley-Blackwell, 2017), 514–20. By 1907, a backlash against the deleterious influence of the École on American architectural culture was well under way. See J. Stewart Barney, "The Ecole Des Beaux-Arts: Its Influence on Our Architecture," *Architectural Record* 22, no. 5 (November 1907): 333–42.

⁵ On the Clark years at M.I.T., see Chewning, "William Robert Ware and the Beginnings of Architectural Education in the United States, 1861-1881," 149–60. With respect to the slow drift of architecture toward the fine arts over the course of the nineteenth century, the development in 1895 of a separate program in architectural engineering at the University of Illinois, which would be tailored more specifically to construction, was symbolic.

⁶ Chewning, 182–84.

⁷ Ulrich Pfammatter, *The Making of the Modern Architect and Engineer: The Origins and Development of a Scientific and Industrially Oriented Education* (Basel; Boston: Birkhauser-Publishers for Architecture, 2000); Andrew Saint, *Architect and Engineer: A Study in Sibling Rivalry*, First Edition (New Haven; London: Yale University Press, 2008); Paul Zucker, "Architectural Education in Nineteenth Century Germany," *Journal of the American Society of Architectural Historians* 2, no. 3 (1942): 6–13; Vincent Clark, "A Struggle for Existence: The Professionalization of German Architects," in *German Professions, 1800-1950*, ed. Geoffrey Cocks and Konrad Hugo Jarausch (New York: Oxford University Press, 1990), 143–62. For a succinct overview of the different national models of architectural education, see Garry Stevens, "Angst in Academia: Universities, the Architecture Schools and the Profession," *Journal of Architectural and Planning Research* 15, no. 2 (1998): 152–69. Stevens writes, "American professional education can therefore be characterized as university-dominated, as opposed to the British practice-dominated or European state-dominated systems" (162).

⁸ William R. Ware, *An Outline of a Course of Architectural Instruction* (Boston: John Wilson and Sons, 1866), 11.

⁹ William R. Ware, "Architecture at Columbia University," *American Architect and Building News* 10 (August 6, 1881): 61.

¹⁰ Quoted in Richard Plunz, "Reflections on Ware, Hamlin, McKim, and the Politics of History on the Cusp of Historicism," in *The History of History in American Schools of Architecture, 1865-1975*, ed. Gwendolyn Wright, Janet Parks, and Arthur Ross Architecture Gallery, Buell Center Books in American Architectural History, no. 1 (New York, N.Y.: Temple Hoyne Buell Center for the Study of American Architecture and Princeton Architectural Press, 1990), 55. The adversarial attitude shared by academics and practitioners in architecture seems perennial. Robert Gutman writes, "For every practitioner who complains that students have not learned how to draw, to talk to clients and deal with contractors and review boards,

there is a faculty member ready to denounce the profession for the poor quality of design, its excessive commercialism, and its lack of principle and dedication to the art and craft of architecture.” Robert Gutman, “Education and the World of Practice,” *Journal of Architectural Education* (1984-) 40, no. 2 (1987): 24.

¹¹ My argument agrees with previous assessments of Ware’s pedagogical legacy—Gwendolyn Wright, for example, has claimed that “Architectural history courses legitimated professional training within the country’s liberal arts universities”—but tries to describe the function of historicism in much greater detail. See Gwendolyn Wright, *The History of History in American Schools of Architecture, 1865-1975*, ed. Janet Parks, Buell Center Books in American Architectural History, no. 1 (New York, N.Y.: Temple Hoyne Buell Center for the Study of American Architecture and Princeton Architectural Press, 1990), 17. My attempt to situate Ware within a broader cultural history, as opposed to only the history of architectural education, has been informed by Leslie Butler, *Critical Americans: Victorian Intellectuals and Transatlantic Liberal Reform*, First Edition edition (Chapel Hill: The University of North Carolina Press, 2007).

¹² William R. Ware, *Outline of a Course*, 16–17.

¹³ See the “Histories” section of James Elkins, *Why Art Cannot Be Taught: A Handbook for Art Students*, First Paperback Edition (Urbana: University of Illinois Press, 2001), 5–40.

¹⁴ Jon Klancher, *Prose*, 2009,

<http://www.oxfordreference.com/view/10.1093/acref/9780199245437.001.0001/acref-9780199245437-e-571>; Lawrence Buell, *New England Literary Culture: From Revolution through Renaissance* (Cambridge: Cambridge University Press, 1989).

¹⁵ Stefan Collini, ed., *Arnold: Culture and Anarchy and Other Writings* (Cambridge; New York, NY: Cambridge University Press, 1993), 190.

¹⁶ William R. Ware, *Outline of a Course*, 14.

¹⁷ William R. Ware, 18. The original quotation appears in Matthew Arnold, “The Literary Influence of Academies,” *Cornhill Magazine* 10 (August 1864): 154–72.

¹⁸ “Proceedings of the Eleventh and Twelfth Annual Conventions of the American Institute of Architects” (Committee on Library and Publications of the American Institute of Architects, 1879), 25.

¹⁹ On the semantic confluence of the terms “liberal” and “culture,” see Gyorgy Markus, “Culture: The Making and the Make-up of a Concept (An Essay in Historical Semantics),” *Dialectical Anthropology* 18, no. 1 (1993): 3–29.

²⁰ Dennis Domer and Kent F. Spreckelmeyer, eds., *The Liberal Education of Architects: A Symposium Sponsored by the Graham Foundation for Advanced Studies in the Fine Arts* (Lawrence, Kansas: University of Kansas, School of Architecture and Urban Design, 1990).

²¹ William R. Ware, *Outline of a Course*, 28.

²² For references on the idea of education as the panacea of modern society, start with the bibliography in W. Norton Grubb and Marvin Lazerson, *The Education Gospel: The Economic Power of Schooling* (Cambridge, Mass: Harvard University Press, 2004).

²³ William R. Ware, “The Instruction in Architecture at the School of Mines,” *The School of Mines Quarterly* 10 (1889): 29. On the hothouse as a popular Victorian metaphor for the education system, see Caroline Winterer, “Avoiding a ‘Hothouse System of Education’: Nineteenth-Century Early Childhood Education from the Infant Schools to the Kindergartens,” *History of Education Quarterly* 32, no. 3 (1992): 289–314.

²⁴ Richard Hofstadter, *Social Darwinism in American Thought*, Revised Edition (New York: G. Braziller, 1959); Robert C. Bannister, *Social Darwinism: Science and Myth in Anglo-American Social Thought*, First Edition (Philadelphia: Temple University Press, 1979). The quotation from Le Corbusier comes from *Toward An Architecture*, trans. John Goodman, Texts & Documents (Los Angeles, Calif: Getty Research Institute, 2007).

²⁵ Warren, H. Langford, “The Study of Architectural History and Its Place in the Professional Curriculum,” *The Architectural Quarterly of Harvard University* 1, no. 2 (June 1912): 42.

²⁶ William R. Ware, *Outline of a Course*, 28.

²⁷ On the “drift” from liberalism to Progressivism in American intellectual history, see Chapter 8 of James T. Kloppenberg, *Uncertain Victory: Social Democracy and Progressivism in European and American Thought, 1870-1920*, First Edition (New York: Oxford University Press, 1986), 298–348. For helpful overview of liberalism in American thought, also see James T. Kloppenberg, *The Virtues of Liberalism*, 1 edition (New York: Oxford University Press, 2000). On sense training and kinaesthetic knowing, see

Zeynep Çelik Alexander, *Kinaesthetic Knowing: Aesthetics, Epistemology, Modern Design*, First Edition (Chicago; London: University of Chicago Press, 2017).

²⁸ Lorraine Daston and Peter Galison, *Objectivity* (New York, NY: Zone Books, 2010). See also Amanda Armstrong's perceptive review of this work, "Epistemological Liberalism," *Victorian Studies* 50, no. 4 (2008): 658–65. For a discussion of judgment as the essence of criticism, see the entry on "Criticism" in Raymond Williams, *Keywords: A Vocabulary of Culture and Society*, New edition (Oxford ; New York: Oxford University Press, 2014), 47–49. On judgment as the purpose of an education in liberal culture, see Laurence R. Veysey, *The Emergence of the American University* (Chicago: University of Chicago Press, 1965), 180–251. On judgment and liberalism in political theory, see Jennifer Nedelsky and Ronald Beiner, eds., *Judgment, Imagination, and Politics: Themes from Kant and Arendt* (Rowman & Littlefield Publishers, 2001); Ronald Beiner, *Political Judgement*, 1 edition (Routledge, 2013); Leslie Paul Thiele, *The Heart of Judgment: Practical Wisdom, Neuroscience, and Narrative*, 1 edition (New York: Cambridge University Press, 2010).

²⁹ Michael Faraday, "On the Education of the Judgment," in *The Culture Demanded by Modern Life.*, ed. Edward Livingston Youmans (D. Appleton & co., 1867), 188.

³⁰ Sean Keller, *Automatic Architecture: Motivating Form after Modernism*, First Edition (Chicago: University of Chicago Press, 2018).

³¹ W.H. Furness, "The Architect an Artist," *Penn Monthly* 2, no. June (1871): 298.

³² Mariana Griswold Van Rensselaer, "American Country Dwellings (I)," *The Century Magazine* 31, no. 10 (May 1886): 19. Reprinted in Mariana Schuyler Van Rensselaer, *Accents as Well as Broad Effects: Writings on Architecture, Landscape, and the Environment, 1876-1925*, ed. David Gebhard (Berkeley: University of California Press, 1996), 233.

³³ A.D.F. Hamlin, "William Robert Ware," *Journal of the American Institute of Architects* III, no. 9 (September 1915): 383.

³⁴ C. Howard Walker, "William Robert Ware--1832-1915," *Technology Review* 17 (July 1915): 423.

³⁵ Vitruvius, *Vitruvius: "Ten Books on Architecture,"* ed. Ingrid D. Rowland and Thomas Noble Howe, Revised edition (New York: Cambridge University Press, 2001), 22. See also Frank E. Brown, "Vitruvius and the Liberal Art of Architecture," *Bucknell Review* 11 (63 1962): 99–107.

³⁶ See David Rosand's chapter on Alberti, entitled "Disegno: The Invention of an Art" in *Drawing Acts: Studies in Graphic Expression and Representation* (Cambridge, UK; New York: Cambridge University Press, 2002).

³⁷ Bruce A. Kimball, *The "True Professional Ideal" in America: A History* (Rowman & Littlefield Publishers, 1996).

³⁸ Mary Kupiec Cayton, "Who Were the Evangelicals?: Conservative and Liberal Identity in the Unitarian Controversy in Boston, 1804-1833," *Journal of Social History* 31, no. 1 (1997): 85–107.

³⁹ Conrad Wright, *The Beginnings of Unitarianism in America* (Boston: Starr King Press : Distributed by Beacon Press, 1955); Daniel Walker Howe, *The Unitarian Conscience: Harvard Moral Philosophy, 1805-1861* (Cambridge, Mass: Harvard University Press, 1970); Conrad Edick Wright, ed., *American Unitarianism, 1805-1865*, Massachusetts Historical Society Studies in American History and Culture, no. 1 (Boston: Massachusetts Historical Society and Northeastern University Press, 1989). On Unitarianism and art education, see Paul Samuel Briggs, "The Influence of Unitarianism on the Inclusion of Art Education in the Common Schools of Massachusetts, 1825-1870" (Ph.D., The Pennsylvania State University, 1995). On Emerson as a Unitarian, see Mary Kupiec Cayton, *Emerson's Emergence: Self and Society in the Transformation of New England, 1800-1845* (Chapel Hill, NC: The University of North Carolina Press, 1992). On William Horace Furness and the influence of Unitarianism on Frank Furness, see George E. Thomas, Jeffrey A. Cohen, and Michael J. Lewis, *Frank Furness: The Complete Works*, Rev. ed (New York, N.Y: Princeton Architectural Press, 1996); Elizabeth M. Geffen, *Philadelphia Unitarianism, 1796-1861* (Philadelphia: University of Pennsylvania Press, 1961); Mark B. Orłowski, "Frank Furness: Architecture and the Heroic Ideal" (Dissertation, University of Michigan, 1986).

⁴⁰ William Ellery Channing, *Self-Culture: An Address Introductory to the Franklin Lectures, Delivered at Boston, September, 1838* (Boston: Dutton and Wentworth, printers, 1838), 17.

⁴¹ Channing, 11–12.

⁴² Jeffrey Steele, ed., *The Essential Margaret Fuller by Margaret Fuller* (New Brunswick, N.J: Rutgers University Press, 1992), 340.

⁴³ James Freeman Clarke, *Self-Culture; Physical, Intellectual, Moral and Spiritual; A Course of Lectures* (Boston, New York: Houghton Mifflin company, 1880), 31.

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- ⁴⁴ Clarke, 31.
- ⁴⁵ Channing, *Self-Culture*, 30.
- ⁴⁶ Channing, 31.
- ⁴⁷ Clarke, *Self-Culture; Physical, Intellectual, Moral and Spiritual; A Course of Lectures*, 310.
- ⁴⁸ Clarke, 313. See also Noah Porter, *Books and Reading; or, What Books Shall I Read and How Shall I Read Them* (New York: C. Scribner & co., 1871).
- ⁴⁹ Kenneth Hafertepe and James F. O’Gorman, eds., *American Architects and Their Books to 1848*, Studies in Print Culture and the History of the Book (Amherst: University of Massachusetts Press, 2001); Kenneth Hafertepe and James F. O’Gorman, eds., *American Architects and Their Books, 1840-1915*, Studies in Print Culture and the History of the Book (Amherst: University of Massachusetts Press, 2007).
- ⁵⁰ Narciso G. Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan* (Madison: University of Wisconsin Press, 1981); Edward H. Madden, “Transcendental Influences on Louis H. Sullivan and Frank Lloyd Wright,” *Transactions of the Charles S. Peirce Society* 31, no. 2 (1995): 286–321; Jerome Klinkowitz, *Frank Lloyd Wright and His Manner of Thought*, First Edition (Madison, Wisconsin: University of Wisconsin Press, 2014).
- ⁵¹ Louis H Sullivan, *The Autobiography of an Idea* (New York: Dover Publications, 1956), 191.
- ⁵² Sven Beckert, *The Monied Metropolis: New York City and the Consolidation of the American Bourgeoisie, 1850–1896* (Cambridge: Cambridge University Press, 2003); Frederic Cople Jaher, *The Urban Establishment: Upper Strata in Boston, New York, Charleston, Chicago, and Los Angeles* (Urbana: University of Illinois Press, 1982). On the uneven development of New York’s real estate market, see David M. Scobey, *Empire City: The Making and Meaning of the New York City Landscape* (Philadelphia: Temple University Press, 2003).
- ⁵³ The best source on architecture in New York City in this period remains Robert A. M. Stern, Thomas Mellins, and David Fishman, *New York 1880: Architecture and Urbanism in the Gilded Age* (New York, NY: Monacelli Press, 1999).
- ⁵⁴ On “cultural gentry” and “civic-minded capitalists,” see Scobey, *Empire City*, 194.
- ⁵⁵ William P. LaPiana, *Logic and Experience: The Origin of Modern American Legal Education*, 1 edition (New York: Oxford University Press, 1994); Kenneth M. Ludmerer, *Learning to Heal: The Development of American Medical Education*, Reprint edition (Baltimore: Johns Hopkins University Press, 1996); William R. Johnson, “Education and Professional Life Styles: Law and Medicine in the Nineteenth Century,” *History of Education Quarterly* 14, no. 2 (1974): 185–207.
- ⁵⁶ E.T. Littell, ed., *Proceedings of the Eighth Annual Convention of the American Institute of Architects, Held in New York October 14 and 15, 1874* (New York: Committee on Library and Publications of the American Institute of Architects, 1875), 24.
- ⁵⁷ Littell, 24.
- ⁵⁸ Judith S. Hull, “The ‘School of Upjohn’: Richard Upjohn’s Office,” *Journal of the Society of Architectural Historians* 52, no. 3 (1993): 281–306. There were, of course, important exceptions to the academicization of architectural education, especially for those who aspired only to become a draftsman. For an important example, see Wilbert Hasbrouck, *The Chicago Architectural Club*, First Edition (New York, N.Y.: The Monacelli Press, 2005). On the transition from practice to school-based professional education in general, see Michael Burrage, “From Practice to School-Based Professional Education: Patterns of Conflict and Accommodation in England, France, and the United States,” in *The European and American University since 1800: Historical and Sociological Essays*, ed. Sheldon Rothblatt and Björn Wittrock (Cambridge; New York, NY, USA: Cambridge University Press, 1993), 142–87.
- ⁵⁹ On the structural ambiguity of professional schools, see Donald W. Light, “The Development of Professional Schools in America,” in *The Transformation of Higher Learning, 1860-1930: Expansion, Diversification, Social Opening, and Professionalization in England, Germany, Russia, and the United States*, ed. Konrad Hugo Jarausch (Chicago: University of Chicago Press, 1983), 346. Robert Gutman has characterized the structural ambiguity of professional schools of architecture in the United States in terms of an unrelenting “adversarial attitude” between the profession and the discipline. “For every practitioner who complains that students have not learned how to draw, to talk to clients and deal with contractors and review boards, there is a faculty member ready to denounce the profession for the poor quality of design, its excessive commercialism, and its slack of principle and dedication to the art and craft of architecture.” “Education and the World of Practice,” 24.
- ⁶⁰ Stefan Muthesius, “Eclecticism,” in *Grove Art Online* (Oxford University Press, January 1, 2013), <http://www.oxfordartonline.com/groveart/view/10.1093/gao/9781884446054.001.0001/oa->

9781884446054-e-7000024845. One should also keep in mind that the term “eclecticism” was not restricted to discussions of architectural style in the nineteenth and early-twentieth centuries. Paul Starr describes the “Eclectic” physicians and homeopaths in the American Midwest in this same period in *The Social Transformation of American Medicine: The Rise of a Sovereign Profession and the Making of a Vast Industry*, 2 edition (New York: Basic Books, 2017), 190. What eclectic philosophers, architects, and physicians shared was a willingness to diverge from established knowledge and authorities.

⁶¹ Carroll L. V. Meeks, “Creative Eclecticism,” *Journal of the Society of Architectural Historians* 12, no. 4 (1953): 15–18; Richard Guy Wilson, “Architecture and the Reinterpretation of the Past in the American Renaissance,” *Winterthur Portfolio* 18, no. 1 (1983): 69–87; Richard W. Longstreth, “Academic Eclecticism in American Architecture,” *Winterthur Portfolio* 17, no. 1 (1982): 55–82.

⁶² Tony Bennett, “The Exhibitionary Complex,” *New Formations* 4, no. Spring (1988): 73–102.

⁶³ My emphasis on the organization of information has been influenced by Ann Blair’s work on storing, sorting, selecting, and summarizing information in early modern intellectual history. See Ann M. Blair, *Too Much to Know: Managing Scholarly Information before the Modern Age*, First Edition edition (New Haven London: Yale University Press, 2011). On graphic means of ordering architectural information in the twentieth century, see Andrew M. Shanken, “From the Gospel of Efficiency to Modernism: A History of Sweet’s Catalogue, 1906-1947,” *Design Issues* 21, no. 2 (2005): 28–47.

⁶⁴ J. Mordaunt Crook, *The Dilemma of Style: Architectural Ideas from the Picturesque to the Postmodern*, 1 edition (Chicago: University of Chicago Press, 1987), 46.

⁶⁵ David Brain, “Discipline & Style: The Ecole Des Beaux-Arts and the Social Production of an American Architecture,” *Theory and Society* 18, no. 6 (1989): 807–68. The basic outline of Brain’s argument is heavily indebted to Paul S. Boyer, *Urban Masses and Moral Order in America, 1820-1920* (Cambridge, Mass: Harvard University Press, 1978).

⁶⁶ Gwendolyn Wright, for example, followed sociologists like Magali Sarfatti Larson when she characterized the mobilization of these claims around turn-of-the-century Chicago as a strategy of “defensive conservatism.” See Gwendolyn Wright, *Moralism and the Model Home: Domestic Architecture and Cultural Conflict in Chicago, 1873-1913* (Chicago: University of Chicago Press, 1980), 49.

⁶⁷ See, for example, Bryan E. Norwood, “Inventing Professional Architecture,” in *The University of Illinois*, ed. Frederick E. Hoxie, Engine of Innovation (University of Illinois Press, 2017), 93–100. Norwood recites the standard, somewhat misleading assessment of Ware’s career: “The model for forming a distinct kind of architectural knowledge destined to become the most prominent in the early twentieth-century universities would be that of the design studio (*atelier*) used at the French École des Beaux-Arts. Beginning with the architect Richard Morris Hunt’s residency in Paris during the 1840s and 1850s, American attended the École (as they called it) at an increasing frequency up through the early decades of the twentieth century. These students brought back ideas (which did not always reflect the total educational mission of the École) about the fundamentality of design and composition in architectural knowledge. Architectural expertise was to be found primarily in the principles of formal composition—such as proportion, arrangement, scale, and axial relations of basic building elements—and character worked out through the medium of drawing. Studio-based education sought to impart these fundamentals. The architecture school at MIT, for example, founded under the guidance of William Ware (who had trained in the atelier of Hunt) was strongly influenced by this model” (95).

⁶⁸ For an introduction to cultural techniques with an excellent bibliography, see Geoffrey Winthrop-Young, “The Kultur of Cultural Techniques: Conceptual Inertia and the Parasitic Materialities of Ontologization,” *Cultural Politics* (Duke University Press) 10, no. 3 (2014): 376–88.

⁶⁹ What little literature there is on relationship between architecture and reading concentrates on the early modern period. For an introduction to this literature, see Sarah McPhee, “The Architect as Reader,” *Journal of the Society of Architectural Historians* 58, no. 3 (1999): 454–61. Christy Anderson was one of the first scholars to combine the history of reading with the history of architecture. See her “Inigo Jones’s Library and the Language of Architectural Classicism in England, 1570-1640” (Massachusetts Institute of Technology, 1993); “Learning to Read Architecture in the English Renaissance,” in *Albion’s Classicism: The Visual Arts in Britain, 1550-1660*, ed. Lucy Gent (New Haven ; London: Paul Mellon Centre BA, 1996), 239–86.

⁷⁰ Michel Foucault, “Fantasia of the Library,” in *Language, Counter-Memory, Practice: Selected Essays and Interviews*, 1 edition (Ithaca, NY: Cornell University Press, 1980), 91.

⁷¹ Foucault, 90–91.

⁷² The classic account of the productive power of confession is in Michel Foucault, *The History of Sexuality, Vol. 1: An Introduction*, Reissue edition (New York: Vintage, 1990). See also Michel Foucault, *Discipline & Punish: The Birth of the Prison*, trans. Alan Sheridan (New York: Vintage Books, 1995).

⁷³ Norbert Elias, *The Civilizing Process: Sociogenetic and Psychogenetic Investigations*, Revised edition (Oxford; Malden, Mass.: Blackwell Publishing, 2000). Elias writes, "The increased demand for books within a society is itself a sure sign of a pronounced spurt in the civilizing process; for the transmission and regulation of drives that is demanded both to write and read books is always considerable" (401). For an account of the science of psychology's impact on architectural education, which occurred in a later period than the one I discuss in this section, see also Mark Jarzombek, *The Psychologizing of Modernity: Art, Architecture and History* (Cambridge, U.K. ; New York: Cambridge University Press, 1999).

⁷⁴ For a representative example of architectural history written on the jurisdictional model, see Saint, *Architect and Engineer*. On social closure in the profession of architecture, see Judith R. Blau, *Architects and Firms: A Sociological Perspective on Architectural Practices* (Cambridge, Mass.: MIT Press, 1987); Magali Sarfatti Larson, *Behind the Postmodern Facade: Architectural Change in Late Twentieth-Century America* (Berkeley: University of California Press, 1993). More generally, see Andrew Abbott, *The System of Professions: An Essay on the Division of Expert Labor* (Chicago: University of Chicago Press, 1988); Randall Collins, *The Credential Society: An Historical Sociology of Education and Stratification* (New York: Academic Press, 1979).

⁷⁵ Gil Eyal, "For a Sociology of Expertise: The Social Origins of the Autism Epidemic," *American Journal of Sociology* 118, no. 4 (2013): 863–907.

⁷⁶ Eyal, 877.

⁷⁷ Eyal, 864.

⁷⁸ Michel Foucault, *Technologies of the Self: A Seminar with Michel Foucault*, ed. Luther H. Martin, Huck Gutman, and Patrick H. Hutton, 1st edition (Amherst: University of Massachusetts Press, 1988), 36.

**Chapter Three:
Architecture in the Age of University Reform:
Professionalism, Classicism, and the Study of Architectural History at Columbia**

Between Ware's move to Columbia in 1881 and the establishment of the Association of Collegiate Schools of Architecture in 1912, architectural educators in the United States struggled to address what Arthur Weatherhead has called "the two-fold problem" of preparing students for professional work while also developing a curriculum that conformed to academic standards. As Weatherhead notes, in this period when architectural education was pulled in the separate directions of professional and disciplinary growth, "the continual adjustment of the demands of these two often-conflicting situations was everywhere apparent."¹

Countless scholars, studio instructors, and professionals in architecture have commented upon the uncomfortable experience of working within the two-fold problem, including several of the most influential voices in the field. In 1947, Siegfried Giedion, on behalf of the Congrès Internationaux d'Architecture Moderne (C.I.A.M.) proposed dissolving the collegiate system of architectural education and designing a new model of architectural training under the auspices of the United Nations Educational, Scientific, and Cultural Organization (U.N.E.S.C.O.).² This was really an attempt to avoid the problem rather than resolve it. Others have simply accepted architecture's status as an institutional deviant. In 1985, Henry N. Cobb, then the dean of the Architecture Department at Harvard's Graduate School of Design, characterized the discipline as a "misfit" on campus, akin to the bedraggled, perpetually dust- and dirt-ridden character of Pig-Pen in Charles Schulz's famous cartoon series *Peanuts*.³ Mark Wigley, before he became the dean of the Graduate School of Architecture, Planning, and Preservation at Columbia University in 2004, referred to architecture as a "prosthetic" to the traditional idea of the university, incorporated so as to preserve the myth of the university's intellectual autonomy from the material world.⁴

For figures like Cobb and Wigley, what has made the relationship between architecture and the university problematic is the complex process of teaching, learning, and evaluating design. In the roughly thirty-year period under analysis, learning to design became the core of architectural education, displacing competencies associated with building construction. The problem, however, with this development was that it was—and remains—difficult to account for the design process in academic terms, likely a difficulty that stems from the complexity of visual thinking and its resistance to verbal or mathematical notation. Just as collegiate schools of art and music face basic questions of how one becomes an artist and whether artistry is really something that is teachable, the institutional legitimacy of the collegiate system of architectural education depends on the ability to provide a compelling account of how one acquires architectural expertise and becomes, in turn, an architect.⁵ As Robert Gutman, the famed sociologist of architecture, recognized, when design became the core of architectural education,

“architectural education [became] really a version of aesthetic education.”⁶ Following this logic, he suggested that it would be more appropriate to compare the history of architectural education to the history of other kinds of art education centered on the training of judgment, such as instruction in musical composition, rather than the history of legal and medical education. Indeed, that comparison might be fruitful, but it would likely distort our understanding of Ware and his colleagues. Their ambition was to use the university to elevate the broad base of their profession to the status of other professionals and, as we will see, they shared with educators in law and medicine similar pedagogical terms and strategies.

During the late nineteenth century, one way for educators to avoid the pedagogical ambiguities surrounding design was to create separate programs in architectural engineering, the first of which appeared in 1890 at the University of Illinois. In these programs, students spent the majority of their time in the research laboratory rather than the studio. In 1881, Frank Eugene Kidder, who would later author titles such as *The Architect's and Builder's Pocket-Book* (1890) and *Building Construction and Superintendence* (1897) created what was essentially a shop course at M.I.T. called the “Architectural Laboratory” in which students completed exercises and experiments in construction and learned to test materials.⁷ In 1903, the Engineering Department of the University of Illinois, which included the Illinois’s course in architecture, received \$150,000 in funding from the Board of Trustees. Nathan Clifford Ricker, the head of the Engineering Department and the architecture course, used a portion of this appropriation to equip the engineering and architecture libraries. Most of it, however, Ricker used to create an Engineering Experiment Station where Illinois’s engineering students, including the small portion that was majoring in architectural engineering, learned to test construction materials like brick, concrete, and steel (FIGURES 21, 22, 23).⁸ Through laboratory research, which assured administrators that architecture met academic guidelines and continued to be a useful art, architectural educators maintained a secure institutional footing within the university by affiliating themselves with scientific authority.

In the twentieth century, once America’s initial enthusiasm for the Beaux-Arts system of instruction abated, the laboratory sciences continued to serve architectural educators as a model of disciplinary belonging. Recently, several historians have described how a steady stream of American educators after World War I tried to adapt the discipline to positivist research models in the physical and computer sciences in order to “re-professionalize” architecture along non-artistic lines that eschewed the formalism then dominant in architectural education. Bentel has studied how the leaders of the American Institute of Architects promoted industrial efficiency, scientific management, and the architect’s position as an expert in the construction industry between 1919 and 1933.⁹ Sachs has addressed how educators in the 1950s like Konrad Wachsmann, an architect based first at the Illinois Institute of Technology and then at the University of Southern California, and William Caudill at Texas A&M secured federal research funding for their architecture departments in the postwar craze for basic science.¹⁰ Sachs has also addressed subsequent periods in the history of architectural research in her analysis of how American architects in the 1960s and 1970s re-professionalized around the multi-

disciplinary field of the environmental sciences.¹¹ Similarly, Dutta has edited a volume of important essays that describes a decentralized “second modernist” campaign to develop systems-based techniques of information management and computer-aided design in the “closed world” of the Cold War era. These projects, which led architectural researchers at M.I.T. and Cambridge University to confront the “hard” questions of data manipulation, complexity, and model simulation, received government funding because they served the biopolitical function of environmental control.¹² Finally, in the counter-cultural backlash against expert authority in the 1970s, architectural scholars developed new models of research based on survey methodologies prominent in the social sciences, leading to the growth of scholarship on the “social and cultural factors” that determined a user’s experience of the built environment.¹³ In all of these different chapters in architecture’s relationship to the university, research constituted an attempt to construct a definition of architectural expertise that was not determined by the “soft” or subjective aspects of design, such as inspiration, intuition, or imagination. This was an objectivist definition of expertise unburdened by aesthetic questions of taste or judgment.¹⁴

With this literature on the history of architectural research in the twentieth century in mind, we can begin to reconsider the historicist orientation of architectural education in the late nineteenth century, the age of the American Renaissance and of “academic” or “scientific” eclecticism, when Ware, A.D.F. Hamlin, Henry Van Brunt, H. Langford Warren (the founder of the Architecture Department at Harvard), Howard Crosby Butler (who became the first director of the School of Architecture at Princeton), and Ralph Adams Cram—Morgan and Cheek call this group the “architect-historians”—began to prioritize historical scholarship over artistic style.¹⁵ As Barry Bergdoll has written, “the central tenet of historicist architecture in the nineteenth century [is] that architecture itself was a kind of research, research that would draw variously on the privileged disciplines of the period which explained patterns of change and the relationship between types or norms and changes, development, or even evolution.”¹⁶ Most historians view Ware’s contribution to architectural education in the United States after 1881 as a necessary prelude to the Americanization of the Beaux-Arts system. This chapter follows Bergdoll and argues that Ware’s program at Columbia was also a part of the history of architectural research. Ware’s conception of architectural research was distinctive because he viewed it in broadly empirical terms and not in terms of laboratory methods of engineering or the natural sciences. Ware’s disciplinary agenda was determined by the emergence in the 1880s and 1890s of a revitalized notion of historicism that was located between the humanities and the then-emerging, fact-based social sciences.¹⁷

My argument proceeds in two sections, both of which add new layers to the existing scholarship on this period in the history of architectural education. First, I contextualize Ware’s course at Columbia within a growing academic culture of professionalism, one that shared an interest in the concept of precedence and the case-method system of instruction as instruments of information management.¹⁸ The study of architectural history aligned Ware’s program with historicist methods in other professional fields, such as law and medicine, where one could also find students learning to extract

principles from notable cases in a disciplinary canon in order to direct their practice in the future. Historians of modern art and thought often take it for granted that the precedent serves only to transmit classical forms of authority and to coordinate art-theoretical concepts associated with the opposition of reason to imagination, such as originality, invention, imitation, and plagiarism. By comparing the history of architectural education to the history of legal and medical education in the late nineteenth century, I aim to demonstrate that the increasing prominence of architectural precedent in the architectural discourse of the 1880s and 1890s actually represented the discipline's engagement with progressive pedagogical values, not with a kind of defensive aesthetic conservatism.

Second, I identify philology as the underlying model of scholarship that most influenced the architect-historians. Ware and his colleagues did not reference philology specifically in their published writing, but their interest in architectural history shared many of the same tendencies as the late-nineteenth-century culture of classicism in the United States.¹⁹ When the discipline of architecture entered the American university, philology was transforming from a unified, rigorously descriptive field associated with the study of antiquity to the expansive field that we now know of as the modern humanities. This process of philological expansion irrigated the field of architectural education by supplying it with several key disciplinary tenets, such as the need to contextualize a given building within its culture and the idea that one could track historical development through the transfiguration of decorative forms, which was especially apparent in the histories of ornament produced in this period.

Philology also supplied architect-historians with a cultural rationale for their research. Like other educators associated with the American university's turn-of-the-century culture of classicism, Ware and his colleagues looked to ancient, medieval, and Renaissance history as a source of liberal culture that helped to inoculate or restrain students from the materialistic and nationalistic tendencies of modernity. For architect-historians, the study of architectural history had no immediate utility value in an industrial society—it did not provide a catalog of ready-made styles or ornamental forms—but it did serve as a series of *exempla* that sharpened the interpretive ability necessary for a student to understand how a project might fit within a larger culture or moment in time. In conceptualizing buildings as *exempla*, these professional educators re-directed the research process to cultural rather than scientific ends. Here the cultures of professionalism and classicism overlapped. In the words of Boston architect Robert Day Andrews, one of Ware's students at M.I.T., "The measure of every man's attainment lies within himself. To enlarge that measure of attainment is the broadest service of precedent. The broadest use of precedent is self-culture."²⁰

However unrefined the historicist pedagogy of the architect-historians might have been, and however provisional the position of architecture between the cultures of professionalism and classicism might have been within the university, their combination of design with history was at least momentarily effective in embedding the discipline or architecture within elite universities that would embrace the modern humanities after the turn of the century, including Columbia, Harvard, Princeton, and Notre Dame, as well as

the schools that were led by members of Ware's pedagogical diaspora, including Nathaniel Cortland Curtis, a Columbia student who directed Tulane's School of Architecture. In 1903, administrators at Columbia forced Ware into retirement and installed an atelier system of Beaux-Arts instruction to increase the quality of student work. But as late as 1932, after the Beaux-Arts system had begun to disintegrate and just before the arrival of European modernism and the reconfiguration of the collegiate system of architectural education along the technological axes of modernism, educators could still feel the institutional legacy of Ware's historicist model of instruction. F.H. Bosworth and Roy Child Jones wrote in their evaluation of American architecture schools:

Architecture itself has been affected by its academic surroundings; and, conversely, the scholarly calm of arts and science has been awakened to a more sympathetic appreciation of joyous creative work as something beyond mere vocationalism, and possibly of comparable educational value to plodding research. Architecture is beginning to demand a higher standard of scholarship from its teachers; it is beginning to appreciate the importance of deep study and research as true aids to its own creative ends; it is losing its fear of real thought as a supplement to inspiration. If architecture had remained a self-contained and self-controlled unit, unconnected with any institution of higher learning, it is questionable if this change in attitude would have come so rapidly; or that, without these mental frictions, be they with engineering or liberal arts, it would have broadened and liberalized its point of view to the extent it has in many schools. Thinking is a co-operative undertaking, and the university surroundings have forced and perhaps materially helped architecture to define in its own mind the difference between vocationalism and professionalism and to clarify its educational aims.²¹

The Rise and Fall of the Architectural Precedent in the Culture of Professionalism

When Ware joined the School of Mines in 1881, Columbia was midway through its transformation from a conservative college to a modern research university. A crucial component of this transformation was the growth of professional schools and the development of pedagogies specifically directed toward the development of professionals. In 1858, Theodore W. Dwight founded the Columbia Law School. In 1860, the College of Physicians and Surgeons, originally founded by the state of New York in 1807, became the official medical school of Columbia University. In 1864, the year that Frederick A.P. Barnard became college president and began to gradually reform the college's curriculum and administrative organization, Columbia's trustees established the School of Mines. These professional schools served a vital role in Columbia's transformation. When Barnard became president, there were 166 students in the College, 171 students in the law school, and 288 students in the medical school. Although the law school and medical had developed independently from the college, Barnard aspired to make Columbia "the great university of the city—possibly the continent."²² He recognized their popularity and foresaw that professional education,

with its clear public benefit would become an important area of university expansion in the future.²³

To support the growth of his university, Barnard framed professional education as an extension of a liberal arts education, in large part because the mental training involved in a liberal arts education helped him to distinguish professionalism from lower forms vocational training. In his annual reports and in articles published in new education journals like *The American Journal of Education*, Barnard presented professionalism as supplying a liberal arts education with a renewed, secular, and democratic purpose. In his inaugural address, in which, among other topics, Barnard proposed founding additional professional schools in commerce and “applied architecture,” he wrote:

The end to be kept in view in liberal education should be to make of man all that, as an intelligent and moral being, he is capable of becoming, in view of the immortal destiny before him, and with but secondary regard to the accidental interest of this temporary life. I have held that such a culture will actually make him more fit to fill successfully any position to which he may be called in this world, will make him a more efficient worker, a more useful member of society, a better citizen, than any training especially planned with the intent to produce these specific results. And I have also held, that the studies which now occupy the most prominent place in the course of collegiate training, and which have ever occupied that place since our collegiate system was founded, are the studies which, on psychological grounds, are manifestly best adapted to furnish such a culture.²⁴

Seventeen years later, in 1881, Barnard made essentially the same point more succinctly, “There are two stages in this [university] education. The first is subjective; it is to draw out the capabilities of the man himself without reference to any use that is to be made of him, or that he may make of himself. The second is to adapt the capabilities so developed to that special line of effort into which the work of the coming life is to be directed.”²⁵ Barnard’s two-stage model was part of his gradualist strategy of reform that helped to allay the fears of conservative faculty and alumni. It acknowledged the value of mental discipline as a way to fortify the thinking and character of the individual student while also recognizing the wider social value of technical specialization. Barnard refused to contrast culture and utility as competing educational ideals. Like many other influential educational leaders at the time, he tried to balance the long-term benefits of a well-rounded liberal art education with the short-term, narrower, but readily apparent benefits of job-training.²⁶ In locating the first stage of a professional education in the college rather than the office or the jobsite, university reformers like Barnard helped to project an image of the professional as a kind of free thinker, superior, as one commentator put it, to the “routinists, formula-men, rule-of-thumb men” of the artisanal world.²⁷ By establishing this two-stage model of a university education, Barnard set the rhetorical and institutional groundwork for Ware to construct his historicist design curriculum over the next two decades.

The transformation of Columbia under Barnard and Seth Low, his successor as of 1890, reflected what Walter P. Metzger, a historian of academic freedom, once described as an underlying “shift from ‘conserving’ to ‘searching’ in American intellectual history.”²⁸ Liberal education, in a reversal of its classical definition, was now meant to encourage the formation of a professional class that was creative rather than customary, capable of keeping pace with the evolution of scientific knowledge and applying the latest research to the real-world problems of modern life. This was a culture of professionalism taking shape through a dynamic relationship to German concept of *Wissenschaft*, literally knowledge or science, an ideal that the majority of American equated with the embrace of systematic research. The stronger the new “investigative temper” of the university became, the more the nature of scientific authority changed from a substantive to a procedural notion of rationality. Thinking scientifically and working professionally came to mean evaluating evidence and new information by applying a consistent method.²⁹ Architectural education followed the more general orientation of the American university to *Wissenschaft*, layering Beaux-Arts design instruction with yet another European model of learning. Of course, the culture of professionalism differed from the scientific community in that its commercial interests compromised the pursuit of knowledge for its own sake, but the more that professional educators came to rely on university resources like laboratories and libraries to complete medical, legal, or architectural research, the more they adapted their methods of professional instruction to promote the inculcation of an ethic akin to scientific research within their students.

Another difference between science and professionalism was that whereas scientific research involved the manipulation of physical matter, professional research involved the processing of printed information, which, if scoured properly, yielded principles that guided action. A professional was “a man of principle” in the parlance of the late nineteenth century because he was capable of responding flexibly to new situations rather than relying on formula. For example, in his assessment of the need for professional schools, Williams Watts Folwell, the first president of the University of Minnesota, stated, “What we demand then, is not rules, but principles; not mere tricks of art and sleight of hand, but science; science which explains and authenticates art; which makes men masters in their work, and not mere imitators and operatives.”³⁰ Again, in this quotation, which sounds so similar to the rhetoric employed by advocates of the useful arts earlier in the century, we recognize the denigration of the artisan as a figure who relied too often on producing effects that he did not actually understand, blindly following tradition.

Professional ideologues spoke of tradition too, but they demanded a more active relationship to tradition that involved research and study. When Folwell invoked the principles of science as the basis of professional work, he referred to the provisional truths generated through methods of empirical investigation, not the absolute truths of logical deduction, the general laws compiled in the treatises of ancient practitioners, or even the simple, easy-to-remember, proverbial principles of folk knowledge and common sense. This kind of principle was a kernel of truth underlying a mass of data or pattern of events, a unit of knowledge that compressed the rapid proliferation of information after the Civil War in periodical literature and journals.³¹ Unlike the first

principles of philosophy, the pillars on which entire architectonic systems rested, the principles of professionalism functioned more like heuristics that guided action by enabling practitioners to balance new information in relation to patterns established in the past. A professional lawyer, doctor, or architect might not know the right course of action upon first encountering a client's problem, but he could gather relevant facts from similar situations, induct from these situations a unifying principle that helped to diagnose or categorize the problem, and then use this principle to help generate an appropriate response.

Given the turn of the professional ethos toward research and away from a notion of tradition as dogma or inheritance, it was not a coincidence that professional educators in a variety of fields would come to embrace the case-method system of instruction after Christopher Columbus Langdell, a professor at Harvard Law School, introduced it in the early 1870s. Langdell believed that although it was a much more demanding procedure, students learned legal principles more effectively when they were forced to extract them from patterns of facts encountered in individual cases rather than in legal codes or textbooks, where jurisprudential scholars had already completed the hard work of distilling the principles for them. Langdell's idea was to replicate in the classroom the experience of practicing lawyers in the Anglo-American Common Law tradition by having students gather and analyze precedents for themselves. By referring students to records of cases held in a law library or conveniently pre-selected by an instructor in a casebook, Langdell believed that he was habituating students to the task of assembling a compelling argument based on the practice of legal research, which was the job, after all, of the junior analyst in a corporate firm.³² In 1891, William Albert Keener introduced the case-method at Columbia Law School.³³

Langdell's case-method, also known as the "historic method" because of its strong historicist bent, was innovative in at least two important ways. First, it made the process of learning a legal principle equivalent to the process that professionals used in identifying and applying legal principles, minimizing the distance between theory and practice. The epistemological premise of this equivalency was that legal principles were not fixed, ahistorical forms of doctrine based on fundamental moral postulates; they evolved over time through individual acts of judgment in canon of crucial cases. As Justice Oliver Wendell Holmes Jr. wrote in *The Common Law* (1881), "the life of the law has not been logic; it has been experience."³⁴ Second, as an inductive exercise, Langdell's case-method used the printed record of the law in a way analogous to how students and researchers in the physical sciences conducted laboratory experiments or used specimens in museums of natural history or botanical gardens. Behind the rhetoric of inductive legal science, there was the physical infrastructure and research personnel to substantiate legal studies on campus, namely libraries and law librarians. After 1895, Columbia law students completed their case-study research in the north wing of the new Low Memorial Library, adjacent to the Avery Architecture Library (FIGURE 24), where they would have used the university's subscription to the West National Reporter System to gather precedents.

Langdell's case-method quickly migrated from law to other professional schools and academic disciplines in the first three decades of the twentieth century. In 1900, Walter B. Cannon, inspired by a former roommate who studied under Langdell, introduced the case-method system to medical education as a way to study principles of medical intervention within the narrative framework of a clinical report.³⁵ Wallace Donham, an organization theorist who studied under Langdell as a law student, brought the case-method to the Graduate School of Business Administration in 1919. Doyle has described the early adoption of the case-method in schools of education.³⁶ Isaac has discussed the influence of case study in sociology, anthropology, and other fields within the human sciences in the 1920s and 1930s.³⁷

Why did so many American educators in the period between 1870 and 1920 become interested in the technique known as the case-method system? When we recognize that professional educators in a variety of fields, including architecture, became interested in the idea of precedent at roughly the same time, how does that change our understanding of architectural education in this period, when post-eclectic architect-historians like Ware began to refer with increasing frequency to the architectural precedent? The epistemic structure underlying the rise of the precedent in the culture of professionalism was historical evolution, but the tendency to see the truth as progressive change was tempered by the pragmatic limitations of instruction, not least of all maintaining student interest. Precedent was part of a historical imagination, but it was also part of that imagination's location within a particular kind of institution—the university. Because all of these educators embraced the research ethic, they accepted as fact the notion that science advances, that good practitioners try to stay up to date, and, crucially, that there was too much information circulating within any professional community for an individual practitioner to know everything. This last assumption meant that the purpose of a professional education was no longer comprehensive mastery, but the ability to search for and identify relevant cases in a documented canon, to recognize the inherent complexity within those cases as descriptions of real experiences or situations, and to extract a heuristic principle or *ratio decidendi* from cases in order to guide action in the present.

Ware and the other architect-historians of the late nineteenth did not refer explicitly to the case-method system in their published writings, but their interest in developing a system of architectural education around historical research and the study of precedent was both a response to educators in other professional fields and a means of conforming their discipline to one of the university's new pedagogic norms. The historicist moment in American architectural education involved the recognition that architecture has no essence other than to be in time. Because a building or a design is a human, poetic artifact rather than a reflection of a natural or divine order, the student of architecture, as Peter Collins has suggested in his own study of the architectural precedent, "can only learn to deal effectively with what *will* be if they understand the process by which 'what was' became transmuted into 'what is.'"³⁸ For Ware, this meant encouraging students to inhabit the perspective of their disciplinary forbearers. "What occupies the attention of architects of all times is...the single question how to do the work in hand in a sensible and agreeable manner," Ware wrote near the end of his

career. “The way for us to understand why the men of other times answer this question in the way they did, and thus to enter into the real understanding of the results, is to put ourselves as far as possible into their places, and to set before ourselves not their achievements, as examples to be classified, arranged, and comprehended, but the problem they had to solve and the conditions which controlled their solution to it.”³⁹ The case-method system of building a historic canon and the Beaux-Arts system of design instruction dovetailed.

Crucially, however, while the architectural precedent shared with precedents in other fields the idea that principles emerged through historical cases and that the best way to learn these principles was to immerse oneself in history, they never became binding. Legal precedent is binding because case law is the source of the common law. A judge must distinguish a case at hand from precedent to explain the reasoning behind a particular ruling; that ruling then carries the force of law and maintains legal order. The guidelines for following medical precedent are also much stronger than the guidelines for architectural precedent because they help physicians avoid diagnostic errors that can lead, in the worst scenarios, to suffering, injury, or the loss of life. In architecture, using precedents to inform a judgment or ignoring them can only lead to a building that is more or less likely to satisfy the client’s design criteria. Ultimately, like other creative fields, there are no binding guidelines to practice and the force that a given architectural precedent carries only derives from the designer’s discretionary judgment, historical study is meant to refine. The lack of any compelling force makes the use of precedent in architectural practice all the more reliant on the humanistic education of the designer. Only if the designer has been sufficiently socialized to disciplinary tradition such that it becomes meaningful will he or she feel compelled to respond to it.

For Ware, the purpose of researching architectural precedents was to isolate what he called “the elements of architecture,” a phrase that in later years would become closely associated with the compositional theory of Julien Guadet, a French architect who began to teach at the École des Beaux Arts in 1894. Elements were the parts of a building that an architect organized into a whole (or *ensemble*). These elements might be simple or complex. Simple elements included walls, the orders, arcades, doors, windows, vaults, ceilings, or domes. Complex elements included rooms, vestibules, porches, porticoes, stairs, or courts. Simple and complex elements were quasi-grammatical units of architectural knowledge that instructors and students could classify and compare by cataloging relations of similitude and difference, without stoking the temptation to plagiarize by “lifting,” for example, a whole design from a photographic plate. This rhetorical approach to architectural invention, borrowed from the École, fit neatly within the culture of college pedagogy in the United States, where students in reading and composition courses studied the elements of literary style in much the same way.⁴⁰

Learning the elements of architecture and how to manipulate them was how a student learned to compose buildings as wholes, the skill that Ware and many other late-nineteenth-century architects believed was the essence of architectural expertise. In an address that Ware delivered to Columbia’s Alumni Association the day before

graduation in 1888, he wrote, “Finally, or indeed first of all, for this is the architect’s own function, which nobody can discharge for him, he must have skill in composition, in the arrangement of parts, in plan and in elevation, so as to make them comport with one another, and out of given conditions, however diverse, contradictory, and seemingly irreconcilable, to produce a simple, natural, and harmonious whole.”⁴¹ Of course, one sociological explanation for the adoption of French compositional theory by American architects near the end of the nineteenth century is that while specialization divided the construction industry and it became less tenable for professionals to identify as master-builders, composition helped professionals retain a position of authority based on their control over the whole design. Professional status was still linked to aesthetic holism, if not the all-around technical ability of the master-builder. But advocates of compositional theory rarely acknowledged that extrinsic motivation in writing.

Instead, Ware and other architect-historians studied the elements of architecture and not specific buildings or prototypes from architectural history because they believed, first, that it was a more scientific approach to the past and thus befitting the university setting, and second, because anatomizing the building into parts helped to ensure that students learned from tradition without directly reproducing it.⁴² Comparing elements helped students construct analogies between the past and the present, reproducing the *character* of a model rather than its particular *form*. In Guadet’s explanation, “When you compose you must have knowledge enough to be able to evoke the *analogy* of the most beautiful models; you must be able to say to yourself, ‘Here is a room which I should like to study in the character of the salons of Versailles, or of the halls of the Palais de Justice, or of the Louvre; this pavilion should have the amplitude of those of our Place de la Concorde, or the elegance of those of the Chancellerie at Rome.’”⁴³ Like a reference to a legal precedent, analogical reasoning was a way to cite shared principles without the constraint of decorative details, maintaining a continuum of practice while allowing for growth.

Analogy was also a safeguard against plagiarism, a constant fear of the architect-historians and frequently discussed in the architectural press around the turn of the century, where precedent study came to be closely associated with that quintessentially Victorian obsession, the regulation of aesthetic desire. Most importantly, precedent controlled the romantic impulse to be original. In the 1890s, American architectural criticism began to viciously critique the use of precedent by contemporary designers. This was around the same time that the editors of the *Architectural Record* (established in 1891 by Clinton Sweet of *Sweet’s Catalogue*) began a public shame campaign against architects who misused or ignored precedent under the banner of “Architectural Aberrations.”⁴⁴ The tone of architectural criticism in this period could become quite nasty, and the architect-historians were especially unforgiving in their contributions. In 1893, during his first year as an instructor in Harvard’s architecture course, Warren published a two-part article entitled “The Use and Abuse of Precedent” in M.I.T.’s *Technology Architectural Review* (FIGURE 25), the first student architecture journal in the United States.⁴⁵ Like Ware and Van Brunt, Warren thought that the century-long search for an original style had already proven fruitless and that historical consciousness was simply an unavoidable part of the modern condition. For a designer to willfully ignore

precedent would only result in purely utilitarian structures or to “architectural nightmares” draped in “a miserable, ungrammatical, ridiculous hodgepodge,” which he then illustrated with reference to Norris G. Starkweather’s Potter Building (1882-86) in New York City, an attempt to combine the Queen Anne and neo-classicism for an iron-framed office building.⁴⁶ As an instructor and as a critic, Warren believed that it was his responsibility to help the public distinguish “the ignoramuses and charlatans” from the “well-trained architects of some artistic power.”⁴⁷

Warren’s articles presented the reader with different case studies, including juxtapositions of photographic evidence, on the use and abuse of precedent in contemporary architecture. First, Stanford White’s New York Herald Building (FIGURE 26), the preliminary drawings for which were released to the public in 1893 (the building was completed in 1895), which was based on the Venetian Renaissance Palazzo del Consiglio in Verona, constructed in 1476 (FIGURE 27). Second, the building for the American Fine Arts Society (FIGURE 28), completed in 1892 and designed by Henry Hardenberg, William C. Hunting, and John C. Jacobsen. This building was based on a 16th-century French Renaissance hunting lodge constructed for King Francis I (FIGURE 29). Warren condemned both buildings as examples of “ill-advised plagiarism.” Although they were pleasing objects to behold, as architecture, he found the direct transplantation of Renaissance designs into the urban fabric of Manhattan to be completely out of context. “Appropriateness to situation and to use is an important element of beauty which is too often neglected, and which, properly observed, would prevent such plagiarism as we have referred to,” he wrote.

However beautiful an object may be in itself, it loses much of its own beauty when out of harmony with its surroundings, just as a beautiful combination of color may be utterly ruined in effect by juxtaposition with other and discordant shades. The environment and situation of a building ought to be considered as important elements in the problem of design. As the various conditions of use and environment may be said to be never twice alike, it may be set down as a general rule that the wholesale borrowing of the design of any building or of any dominant feature is, if not always a mistake, at any rate always dangerous. If the original we admire is entirely appropriate to the situation and use for which it was designed, it cannot be entirely appropriate for any new purpose or different situations. The copying of individual features of a building is of sufficiently doubtful expediency, and to be done successfully must be guided by the most sensitive appreciation of functional expression and of aesthetic appropriateness and harmony, but it is a safe rule to say that the copying of the main motive of any building entirely is always to be avoided.⁴⁸

After citing these abuses, Warren then considered several projects that he believed demonstrated the appropriate use of precedent. Designers might “judiciously” borrow complex elements like towers from older buildings, given that these features functioned more or less in the same way in the 1890s. He cited the spire-crowned tower of the Arlington Street Church in Boston (completed in 1861), designed by Arthur Gilman and Gridley J.F. Bryant, based on the tower that James Gibbs designed for St. Martin’s-in-

the-Fields in London (completed in 1726). Warren also applauded Stanford White's design for the tower of Madison Square Garden II, completed in 1890 and based on the Giralda of the Seville Cathedral, as "a splendid example of the best use of precedent."⁴⁹

Neither Warren nor his architect-historian colleagues were able to provide strict guidelines for using precedent correctly. Recourse to the doctrine of propriety was their only failsafe. "All good architecture has been a growth," Warren claimed, but he also readily admitted that "the dividing line" between the buildings that used precedent effectively and "those which hover on the border-land of plagiarism is not easy to trace."⁵⁰ The historicist idea that architecture "has been a growth" and that precedents guided this growth invalidated the older, neo-classical belief that one could imitate Greco-Roman forms or formulas—as measured and described, for example, in the Stuart and Revett's *Antiquities of Athens* (published in 1762)—because those forms were based on universal laws. The best outcome that a critic like Warren could hope for was that the circulation of good and bad cases in the architectural press and the study of those cases in schools would transmit the prohibition against either copying or ignoring precedent to younger designers.⁵¹ The pedagogical ramifications of the notion that there were vital principles connecting the history of architecture that were separate from classical theory meant, once again, that architectural expertise was judgmental, more dependent on repeated exposure to the visual data of history than a formula in a treatise.

Henry Van Brunt, Warren's fellow critic and Ware's old partner, then the head of the A.I.A.'s Committee on Education, was perhaps the most vocal spokesman for using precedent study as an ascetic cultural practice. In a stream of articles that he published between 1888 and 1893 in the *Technology Architectural Review* he railed against the influence of romanticism on the profession.⁵² "Affectation, mannerism, imitation, insincerity, undisciplined invention, straining for novelties, and all the other evils of illiteracy which pervade the practice of our profession," Van Brunt stated, were the consequences of ignoring tradition.⁵³ Earlier in his career as a critic, in 1861, Van Brunt had celebrated the French architect Henri Labrouste, designer of the Bibliothèque Sainte-Geneviève, and the muted Néo-Grec of Haussmann's Paris for demonstrating the effective use of precedent.⁵⁴ He also commended McKim, Mead, and White's use of Roman precedent in large public buildings like the Boston Public Library. Precedent was a way for Van Brunt to remain ideologically connected to older Victorian moralists like Pugin and Arnold while distancing himself and the professional class for whom he wrote from the changing fashions of the Gilded Age.

A recurring metaphor in Van Brunt's educational commentary was that like an engineered waterway, precedent channeled the creative impulses of young designers, making their work more powerful and more accessible to the public. He wanted young designers to pursue "simplicity of composition."⁵⁵ This meant ignoring the "accidents and incidents in historical art," the "complexities, affectations, [and] conceits" that were of personal interest in favor of a "leading idea" that the lay public could understand and enjoy. Van Brunt recognized that devotion to the leading idea required a strong, ascetic character. "The quality of *reserved force* in design, which is the most direct result of self-

denial, is the most subtle and powerful element of style,” he wrote, making an argument against the work of Victorian eccentrics like Furness.

It confers upon his work a quality of dignity and elegance such as no other virtue of composition can bestow. It does not require explanation. It falters the most careless observer, because the work stamped with this quality is not to him an architectural enigma, like too many of the most scholarly productions of modern architecture, but the direct, concise, and noble statement of a fact, which he who runs may read, and reading, possess unconsciously a standard of criticism which would be intolerant alike of the most learned polyglot and the most vulgar slang in art.⁵⁶

In comparing the reserved force of a leading compositional idea to a “statement of a fact,” Van Brunt exploited a major difference between the use of precedent in architecture and the use of precedent in other fields like the law. In architecture, precedent was ethical, an instrument that controlled the designer’s aesthetic self-interest. Using history to guide judgment did not require explanation; as a “statement of fact,” it ostensibly lessened the need for the public understanding of architectural theory. Alternatively, in law, judges and lawyers must debate the principle embodied in a precedent and whether it applies to the case at hand. The use of legal precedent therefore generates rather than stifles discourse; it provides a rationale for the judge’s decision. Van Brunt’s rhetorical invocation of the precedent was dissimulating. Precedent was an ethical practice and yet it was supposed to be aesthetically neutral.⁵⁷

Van Brunt was well aware of the arguments put forth by skeptics of the collegiate system that in studying the past American architecture students were only learning to speak “dead languages” and slavishly defer to archaeological formulas. He thought that these arguments against what Ruskin called “the Pride of Knowledge” were nonsensical—they certainly would have seemed so to the rest of the university community. In his view, there was nothing to learn from the undisciplined work that filled Victorian cities and no escape from the modern designer’s consciousness of the past. “The array of illogical, undisciplined, ungrammatical, vernacular work, the imitations of imitations, and the endless succession of capricious inventions, which line our streets, and give to the architectural expression of our times an element of vulgarity which does not fairly express the degree of cultivation which we have really reached as shown in all the other arts.”⁵⁸ Like professionals in other fields, American architects retreated to the scholarly world of the university to escape the melee of the city.

Because even the best streets of New York were too often an exhibition of chaotic excess, Ware’s students studied the elements of architecture in an ordered research environment comprised of books, photographs, and plates. In a course entitled “Architectural Essays,” Ware choreographed the study of architectural history as a collaborative research rotation. Following the inductive spirit of the university reform movement, Ware’s ambition in this course was to “merely to open the gates of knowledge, to point the road, to put the traveler in good case for the march, and to equip him with weapons to bring down any game he meets by the way—not to provide

him at the start with all he will ever need.”⁵⁹ Rather than a year-long lecture course on architectural history, Ware lectured only during the first term to provide students with only a suggestive overview of a given period in architectural history. Ware consciously avoided providing a comprehensive historical account. “The better I made my lectures upon architectural history, the less inclination, the less need, the students found for consulting these authorities,” he wrote. “Seven hundred books and twelve thousand photograph stood neglected upon the shelves. This state of things demanded a heroic remedy. The only cure seemed to be to lecture as badly as I knew how—a filed in which nobody can tell what he can do until he tries.”⁶⁰ In the next term, Ware organized the library collection into twelve different “piles” of material on “vaultings, tracery, mouldings [sic], carvings, sculpture, towers and spires, pinnacles and buttresses, etc., etc.”⁶¹ Students spent a week working through each pile, wrote a report, and then rotated to a new pile, where they would begin a new round of research by reading the reports written by piles’ previous investigators.

Ware’s light-hearted description of “Architectural Essays,” with its emphasis on accumulating documented references to each element and his use of the lecture as a mechanism for suggesting future lines of research instead of transmitting dogma, should be read as a translation of historicist architectural theory into the pedagogical terms of the modern research university. In fact, Ware’s teaching method closely resembled what Herbert Baxter Adams of Johns Hopkins University, for many the leading American historian of the 1880s, called “the co-operative method” of conducting a history seminar:

The method consists of a division of labor in a class guided by an instructor, who undertakes to direct special work into cooperative channels. The student, while to some extent upon the common ground of text-books, or prescribed authors, and while taking notes upon class-lectures, of a special character, carried on investigations in close connection with the general course. Written reports are submitted to a critic for correction, are read before an elocutionist for the sake of training in the art of presentation, and are then finally presented, either wholly or in part, to the class, who takes notes and are examined upon these cooperative studies in the same way as on material presented by the instructor.⁶²

It is unclear if Ware knew of Adams’ co-operative method and was consciously trying to adapt it, but the similarities suggest that Ware and Adams shared a willingness to experiment with different methods of teaching history, both motivated by the progressive belief that active learning was preferable to the passive reception of established truth. However *ad hoc* the organization “Architectural Essays” might have been, as a research rotation it demonstrated at least an attempt to follow Columbia’s institutional commitment to *Wissenschaft*.

Yet another reason why precedent study strengthened architecture’s position within the university was because this kind of research helped to produce useful scholarship. It is likely that much of the work that Ware’s students completed in “Architectural Essays” found its way into Ware’s later publications, especially the two volumes of *The American*

Vignola (published in 1902 and 1906), which served architects as a handbook of classical precedents. *The American Vignola* (FIGURE 30), which some contemporary scholars have likened to a blueprint for the spread of the American Renaissance across the United States, codified the elements of architecture into a grammar that included columns, pilasters, entablatures, pediments, pedestals, balustrades, as well as the composition of these elements in doors, windows, wall surfaces, staircases, towers, spires, arches, arcades, vaults, and domes. Ware's text made no attempt at providing a narrative or chronological account of Renaissance architecture. Like Giacomo Barozzi da Vignola's *Regola delle cinque ordini d'architettura* of 1562, the plates included in Ware's handbook explained how to use a module (Vignola used half of the lower diameter of a column) rather than calculations to hasten the process of drawing the Orders.

Unlike Vignola's *Regola*, which originally included only thirty-two plates accompanied by little more than short captions, Ware's text was full of technical details, definitions, and references to important cases that exemplified the use of each element, although as material for precedent study, he never intended the details to be restrictive. "All these forms should be made so familiar that they can be drawn accurately from memory, these arithmetical relations being used only to test the accuracy of the result, or to discover how much the proportions adopted in any given case differ from the regular type," Ware wrote. "For Vignola's Orders are to be regarded only as an admirable standard which may be safely adopted when there is no occasion to do anything else, but which is to be departed from and varied whenever there is any reason for doing so. Vignola obviously so regarded them. He did not himself adhere closely to his own rules, or generally adopt his Order in his own work."⁶³ More than a reproduction of a Renaissance treatise or a celebration of the Italian Renaissance as a cultural ideal for Gilded Age Americans to follow, *The American Vignola* represented the authority of two decades of teaching and student research in a university setting. As Ware wrote in the text's preface, his "experience in the class-room has...amplified and extended" his attempt to devise simple rules for reproducing the Orders.⁶⁴ While Ware intended to organize a curriculum at Columbia around the liberal study of architecture, the outcome of this pursuit, in addition to a cadre of young professionals, was a piece of scholarship that would be of use to the wider public and possibly increase that public's esteem for the university that supported Ware's research.

After 1900, but long before the arrival of European modernism to the United States, Ware's methods of teaching architectural history were discredited by a group of educators associated with a new form of visual education called Pure Design. This group was led by Emil Lorch at the University of Michigan's architecture school and the Harvard art instructor Denman Waldo Ross. Advocates of Pure Design used exercises in formal abstraction to push architecture school curricula away from the liberal arts and closer to the fine arts. For them, precedent represented the mechanical or rote drilling in antiquated styles that destroyed the innate, expressive creativity of the designer—exactly the romantic fallacy that Van Brunt had tried to dispel. Instead of a system of architectural education steeped in a professional engagement with research and precedent study, these advocates of Pure Design, many of whom belonged to

extracurricular sketch clubs around the country, threatened to de-institutionalize architectural education by emphasizing visual harmony, which required minimal research collections, instead of historical knowledge.⁶⁵ Fittingly, the unofficial motto of the Architectural League of America, which in 1899 unified these disparate extracurricular sketch clubs into a national organization, was “Progress Before Precedent.”⁶⁶ Over the next half century, the study of architectural precedent, once a technique used by pedagogues to cultivate a liberal profession, became increasingly associated with aesthetic and cultural conservatism.

The question of precedent thus marked the boundary between two different architectural identities that started to emerge in the 1880s and 1890s. One identity belonged to the culture of professionalism and adapted innovative pedagogies to reinvent the study of architectural history. In theory, it was suspicious of the novelty of any creative act and used scholarly research practices to justify arguments for evolutionary theories of formal development. Those institution builders, like Ware, who cast their lot with precedent, studied the past under the presumption that radical originality was impossible and that style was not something than an individual designer invented. The other identity, closely associated with the image of the architect as a modern artist and the doctrine of Pure Design, was avant-gardist and anti-institutional; it rejected the research ethic as a symptom of imaginative weakness and social conservatism.⁶⁷ Although architecture’s relationship with the fine arts would grow stronger in subsequent decades, it was the professional ideal of using the past to guide the designer’s judgment that helped to institutionalize the discipline of architecture within the university.

From Case to Context: Philology, Architecture, and the Culture of Classicism

“Here in New York we have made rather a specialty of Architectural History,” Ware wrote in 1895.⁶⁸ Indeed, by Ware’s retirement in 1902, the architecture program at Columbia University had become renowned, even infamous, for its emphasis on historical study, attracting students who intended to work in New York firms and “special students” like Arthur Kingsley Porter who would become renowned scholars in their own right.⁶⁹ Roughly half of the Columbia curriculum was devoted to coursework outside of the design studio, including mandatory courses in the history of architecture and ornament during the ancient, medieval, and modern periods. Ware attributed this strong emphasis on history in part to his program’s proximity to the many different collections of books, prints, photographs, drawings, and casts scattered throughout the city of New York, from Columbia’s own library system to the growing collection of the Metropolitan Museum of Art. “If our young men do not profit by these things while they are at school,” Ware admitted, “they will probably never have another opportunity.”⁷⁰ The emphasis on historical study also reflected Ware and Hamlin’s commitment to the idea that history was not just a source of formal precedents, but also a source of liberal values. In learning these values, students cultivated their professional taste and, once again,

demonstrated to the rest of the academic community that there was a place for their discipline within the university.

To profit from New York's growing collection of architectural fragments, however, and to prove that architecture could become a liberal art with deep roots in a scholarly community, required an interpretative framework. That interpretive framework, in the broadest sense, was *philological* and it associated the study of architectural history at Columbia with the humanistic values that the American university's culture of classicism defended. Hamlin described Ware's curriculum as a balance between professionalism and humanism, the use of history as an antidote to the dangers of artistic subjectivity and the use of history to promote cultural understanding. "Culture comes from reading and study, and from contact with what is fine and noble in art and in humanity," he wrote. "Discipline comes from training, self-restraint, and constant practice."⁷¹ Whereas discipline was necessary to control information and prevent copying, the study of architectural history was an attempt by Ware to strengthen the student's imagination and preserve a traditional sense of occupational virtue in the socialization process of becoming an architect. What, then, is philology and did it serve as a disciplinary model for architect-historians in this critical period of institutionalization?

Prior to the rise of the laboratory sciences in the last third of the nineteenth century, philology was the "master-discipline" of the university. In James Turner's estimation, it was "the most influential model of learning" for the generation of scholars and education reformers who came of age after the Civil War.⁷² The German classicist Friedrich August Wolf, a professor at the University of Gottingen, revived the word "philology" in 1777 to describe a totalizing science of human civilization. Philologists investigated the origins and historical evolution of languages and their literatures, using methods of textual comparison to separate the myths from the facts in our understanding of the ancient and biblical past. For much of the early nineteenth century, German and French scholars like Karl Lachmann, François Raynouard, Gottfried Jakob Hermann, George Curtius developed a "grammatical-positivist" or "critical" approach to philology that focused on establishing detailed grammars, lines of linguistic descent, and correcting corrupted texts. In Harpham's summary,

After Wolf, philologists devoted themselves to marking the first occurrences of words or usages, determining the geographical range of certain linguistic forms, noting spelling variations, identifying the sound-structure of words and phrases, and tracking shifts in meaning over time. They counted, measured, and compared; they recorded anomalous instances of verb forms, case terminations, inflections, and moods. They developed methods of comparing grammars and classifying languages into families. The work was arduous, a series of microdescriptions with little opportunity for synthesis, judgment, or reflection. Devoting themselves to the study of texts written in ancient languages—Old Norse, Zend, Old Slavic, Sanskrit, and especially ancient Greek—scholars scarcely lived in the world.⁷³

The “critical” approach continued to grow ever-more arcane throughout the nineteenth century and gave rise to Indology and other Orientalist fields of study, building up philology’s reputation as an erudite, dispassionate, and thereby objective science. At the same time, other philologists, starting with Wolf and followed by scholars like August Boeckh and Ulrich Wilamowitz-Moellendorff, espoused a “historical-cultural” tendency that studied the recurring rhetorical figures and patterns of thought in ancient languages and literatures to illuminate the life-world of the past. This tendency was closely associated with the neohumanism of philhellinists like Wilhelm von Humboldt and with German idealism. Johann Joachim Winckelmann’s *Geschichte der Kunst des Alterthums* (“The History of Art in Antiquity”) of 1764, which tried to account for the growth and decline of Greek art as part of a whole way of life, was for “historical-cultural” philologists paradigmatic. Roughly speaking, these two competing philological tendencies, which were sometimes apparent in the same scholar, fell on opposite sides of the “facts versus values” dichotomy, which Nietzsche, perhaps the most infamous philologist of the late nineteenth century, tried his best to deconstruct.⁷⁴

Philology arrived to America in the 1860s, as Americans became more agnostic (i.e. willing to separate religious from scientific discussions) and as the locus of cultural authority shifted from the clergy to academic experts. These experts, many of whom had studied in Germany, developed a scholarly infrastructure of journals, translators, learned societies, and university departments, most of which were associated with the study of ancient Greece and Rome. Leading high-brow journals like *The North American Review* and the *Atlantic Monthly* published European philologists in translation and reviews of their publications throughout the decade, including the work of Max Müller, the German-born Oxford scholar of comparative religion, and August Schleicher, one of the first linguists to compare languages to organisms and represent their evolution through genealogical tree diagrams, a graphic convention that Sir Bannister Fletcher later utilized to illustrate the historical evolution of architectural styles (FIGURES 30, 31).⁷⁵ Especially popular with American readers were articles that applied philological methods of analysis to religious texts and Anglo-Saxon literature.

Philology’s professional community grew rapidly, aided and abetted by the university’s new graduate programs and expanding range of course options. In 1869, William D. Whitney, a Sanskrit professor at Yale and a member of the American Oriental Society, founded the American Philological Association. In 1880, Basil Lanneau Gildersleve, a classicist who was the first faculty member appointed at Johns Hopkins, created the *American Journal of Philology*. At schools like Yale, Hopkins, Harvard, Cornell, and Columbia, classical and medieval philologists began to compete with the gentlemen amateurs and belletrists, sometimes leading to bitter conflicts between those researchers who were committed to the scholarly ideal of thoroughness and the charismatic generalists who sought in their teaching to share with students with the inspiring experience of great works and ideas.⁷⁶

American interest in philological scholarship was symptomatic of a culture in transition just as much it stemmed from interest in the scientific study of man. Some philologists justified their scholarship by presenting the study of the distant past as a corrective to

the materialism of modern life, the loss of a tangible civic identity or shared belief systems, the gigantisms of the city, or the persistent demand to instrumentalize learning. Given that most philologists spent their time investigating the relationship between formal and cultural transitions, the idea that the entire field of philology was itself an elite, highly-intellectualized collective response to America's growth as an industrialized, urban nation is, perhaps, not surprising. As Adi Eyal has perceptively argued, cultural transitions are not always constituted by radical breaks. Oftentimes, they involve attempts to pattern emergent cultures on established traditions that have been "synchronically preserved, transmitted and shaped" by aesthetic formulae, pictures, or things. "Philology," Eyal writes, "can, thus, be articulated as the manner by which the present is being configured and problematized, owned and possessed, by its own past, at the same moment in which it owns and possess that past."⁷⁷ In architectural history, the re-discovery of the Italian Renaissance by American intellectuals and the reproduction of classical forms in architecture and decoration, which Wilson dates to the 1870s, would be from Eyal's viewpoint a monumental demonstration of this dual philological process of configuration and problematization.⁷⁸

Despite the growing reputation of America's philologists as serious scholars, philology rarely achieved institutional recognition as independent departments within the university. Instead, the diffusion of a shared "philological rationality"—a mutual interest in characterizing national or racial identities that persisted over time, as well as the origin and transmission of generic cultural forms across media, geographical boundaries, or generations—eventually led to departments of linguistics, comparative literature, religious studies, archaeology, anthropology, and many of the other fields that comprise the modern humanities. When philology broke down as a unified master-discipline and became the humanities, architect-historians like Ware encountered an opportunity to modify the institutional status of their discipline by contributing to or mirroring new forms of interdisciplinary scholarship in fields like medieval or Renaissance studies.

The key to recognizing the influence of philology on the study of architectural history in the United States between 1880 and 1900 is to focus on the heightened commitment of architectural historians to hermeneutic methods of comparison and contextualization. As James Turner has explained, scholarship for historical-cultural philologists involved the construction of a circular, ever-widening relation between a text and its given context. Although most philologists—lovers of words, as the term's Greek root suggests—focused on the phenomenon of language and its diverse evolution, the text could potentially be anything: an ancient syntax or piece of religious scripture, a material object like an archaeological relic, a painting, or, in the case of architecture, a building or building fragment. Philologists took a catholic approach to the idea of textuality in part because they recognized that language, as Emerson had declared in 1842, was "fossil poetry," as much an artifact of human culture as any other physical object.⁷⁹ By weaving together different texts and different kinds of texts into a rich contextualization, philologists could begin to distinguish between anomalous and generic forms.

Turner refers to Charles Eliot Norton as the figure who best represents the transition from philology to the modern humanities. When Norton was Ware and Van Brunt's client for the Memorial Hall project in the late 1860s, he was Ruskin's close correspondent and devotee of America's amateur intellectual tradition. In this tradition, intellectual authority was based more on an individual's ability to build up a network of intimate social relations in a republic of letters than on institutional affiliations and professional credentials. But in the 1862 and 1872, Norton also served as joint editor with his friend James Russell Lowell of *The North American Review*, a journal that published essays by several of the foremost European philologists. The *Review* exposed Norton to a different model of intellectual authority than the one he encountered coming of age in New England around midcentury. By the beginning of the 1870s, Norton grew somewhat embarrassed by Ruskin's rejection of the more strenuous, less "appreciative" methods of studying art, and once President Eliot of Harvard appointed Norton to the position of professor of the history of art in 1875—the first of its kind in the United States—Norton fully embraced the pursuit of academic expertise. Previously an author of travelogues like *Notes of Travel and Study in Italy* (1859), Norton now tried to restrict himself to his work as a scholar of Dante and to formalize his social networks by converting them into national organizations like the Dante Society, which he founded in 1881.⁸⁰

Norton was especially important in connecting philologists who worked on ancient and medieval manuscripts with archaeologists and other scholars who studied physical objects to better understand the past. These connections were apparent in the analysis and bibliography of Norton's most important piece of architectural scholarship, *Historical Studies in Church-Building in the Middle Ages: Venice, Siena, Florence* (1880; FIGURE 33), a text that clearly demonstrates the influence of philology on architectural history.⁸¹ Norton, following Ruskin, studied St. Mark's Cathedral in Venice and the Duomo of Siena as symbols that epitomized the entire life and civic culture of medieval Venice and Siena, but the tone was much more restrained.⁸² Like Homer's poetry or the Bhagavad Gita, medieval cathedrals served as a means to illuminate a distant and admirable past. Norton wrote in the introduction to *Historical Studies*, "Among the arts, the one that has alike the closest and widest relations to the life of a people—to its wants, habits, and culture—and which gives the fullest and most exact expression to its moral disposition, its imagination and its intelligence, is that of architecture. Its history during the Dark Ages had been analogous to that of language."⁸³ Like a philologist, in his writing and lecturing he treated buildings as fragments that one could only understand after a wide-ranging attempt at cultural contextualization. Invoking the rhetorical figure of speech of the *pars pro toto*, "the part (taken) for the whole," Norton wrote:

There is a solidarity in the arts; they do not flourish in isolated independence. So at this time art exhibited itself in the least no less than in the greatest things, in the articles of common use as well as of display—in the weaving and embroidery of stuffs; in the shape and ornament of dress; in metal-work of all sorts—the work of the blacksmith no less than of the goldsmith; in armor; in jewelry; in articles for the service of the table or the altar; in the woodwork of the carpenter and the

joiner; in the calligraphy and illumination of manuscripts. Whatever the hand found to do, that it did under the guidance of artistic fancy and feeling...But it was in the great church edifice that many arts were united, as in no other work, in a single joint and indivisible product of their highest energies.⁸⁴

At times Norton indicated that only medieval architecture could be interpreted as an all-encompassing symbol. Near the end of *Historical Studies*, he echoed Ruskin's argument from "The Nature of the Gothic" (from the second volume of *The Stones of Venice*, published between 1851 and 1853) that with the onset of the Renaissance, rising material wealth, private patronage, and the growing artistic identity of craftsmen undermined the civic status of architecture. At other times, such as in his treatment of Greek sculpture or Renaissance paintings, it was clear that the symbolic function of art simply moved to different media in other periods. Nevertheless, the idea that architectural history could anchor new forms of comparative or even interdisciplinary scholarship for those who followed philological methods made the discipline a powerful aid to the humanities.

It is likely that Ware was most directly exposed to philological thinking through his association with Norton, a prolific organizer who, despite being a medievalist, remained devoted to supporting the culture of classicism. Norton founded the Archaeological Institute of America in 1879 and served as the Institute's president until 1890. The original purpose of the Institute was to support excavations and enable young classicists to "gain acquaintance with the land and such knowledge of its ancient monuments as should give a quality to their teaching unattainable without this experience."⁸⁵ Ware, who had published a 24-page, 12-plate handbook entitled *Greek Ornament* in 1878, was elected to the Institute's Executive Committee by its founding members.⁸⁶ In 1881, Norton founded the American School of Classical Studies in Athens. In 1885, Norton and the rest of the American School's governing board elected Ware to become a member of the school's Managing Committee, and the next year asked him to design a building for the school in Athens. Ware completed the drawings in May of 1886 for a two-story, sparsely-adorned cement structure that provided living accommodations for scholars in residence and a working library (FIGURES 34-37). Unable to leave New York because of teaching and administrative responsibilities until 1890, when he travelled to Athens to inspect the building, Ware sent 24-year-old S.B.P. Trowbridge (later principal of the New York firm Trowbridge and Livingston) to Athens to serve as the building's superintendent during construction—only weeks after having graduated from Columbia's architecture program. The American School's building was completed, furnished, and equipped with all of the necessary bibliographic apparatus (including a basement dark room) by April of 1888.

Norton and Ware also worked together to prepare the textbook that they both used for their respective introductory history courses at Harvard and Columbia: Franz von Reber's *Kunstgeschichte des Altertums* (1871, "The History of Ancient Art; FIGURE 38). Having taught at Harvard for eight years without using an English textbook, Norton required students in his fine arts courses to read German. In 1882, Norton employed one of his former students, Joseph Thacher Clarke, to translate Reber's survey into

English. Norton then asked Ware to revise and correct Clarke's final translation after Clarke left the United States to join an archaeological excavation in Assos, Turkey that tried to use philological models to identify the origins of the Doric order. In 1887, Clarke translated Reber's sequel, the *Kunstgeschichte des Mittelalter* (1886), or the *History of Medieval Art*.⁸⁷ Turner notes that Reber's two surveys were the textbooks most often used for American courses on the history of art and architecture in the 1880s and 1890s.⁸⁸ Like Winckelmann's *History of Ancient Art*, they combined the history of architecture with the history of sculpture and painting to present to the reader a broad cultural history of artistic development. Reber united the arts of design in his account because he was the Director of the Bavarian Royal and State Galleries of Painting and wanted to present the general reader with a coherent assessment of the State's collection. Norton and Ware, in contrast, were interested in adapting Reber's text for America's student audience and thus followed a different set of motivations.

For Norton and Ware, Reber's text represented a middle path between more theoretically-speculative philosophies of the fine arts and those surveys that overtly supported the author's stylistic preferences. In Norton's preface to the *History of Ancient Art*, he wrote that Reber should be the preferred guide to the history of the fine arts for Americans because he ignored "the intrusion of metaphysics into [history's] domain, in the guise of a professed but spurious science of aesthetics."⁸⁹ Norton was taking aim at the Hegelian habit, evident in the work of German art historians like Carl Schnaase, the author of the eight-volume *History of the Fine Arts* (published between 1842 and 1879), of centering his narrative of artistic development on a single, underlying principle or mentality at the expense of attending more closely to archaeological detail and formal difference. The philological commitment to forever contextualize prevented him from accepting what he saw as the reduction of poetic forms to ideas. "Few of the general historical treatises on the fine arts that have been produced during the last fifty years have been works of sufficient learning or judgment to give them authority as satisfactory sources of instruction," Norton wrote, taking up the mantle of the critical philologist. "Errors of statement and vague speculations have abounded in them."⁹⁰ In addition to abstaining from any philosophy of history, Reber's surveys were also attractive options for Ware and Norton because they ignored the battle of styles and were thus suitable for a post-Eclectic generation. James Fergusson's *A History of Architecture in All Countries* (published between 1862 and 1867), the first comprehensive survey of world architecture in English, would have been a more convenient option for Norton and Ware than translating Reber, but in that survey Fergusson attacked architectural professionalism and doubted the basic premise of the collegiate system of architectural education: that scholarly knowledge of the past was necessary in the absence of a vernacular tradition. In Fergusson's *History of the Modern Styles of Architecture* (1862), he divided the history of architecture between "the True Styles," including everything up to the sixteenth century, and "the Copying or Imitative Styles" that developed in the Renaissance. Anonymous artisans had developed the so-called "True Styles" according to their local craft traditions, which Fergusson presented as following the sanctified rules of nature. Fergusson argued that with the birth of the professional designer in the Renaissance, individual memory replaced collective reason, architecture lost its "ethnographic value" as a symbol for a particular culture, and all was supposedly lost.

This was similar to Norton's position in *Historical Studies*, except that Fergusson emphasized individualism over materialism as modernity's greatest ill. Fergusson's antipathy to modern architects continued in his later work. "From the building of St. Peter's at Rome to that of [the English] Parliament Houses," he declared at the start of his *History of Architecture in All Countries*, "not one building has been produced that is admitted to be entirely satisfactory, or which permanently retains a hold on general admiration."⁹¹ One can imagine that Ware would not have wanted to share this perspective with his first-year students.

Another likely source of philological influence on Ware's historicism was Hippolyte Adolphe Taine, a French intellectual who came to the attention of the American architectural public around 1864, after he replaced Viollet-le-Duc as a professor at the *École des Beaux-Arts*.⁹² Between 1865 and 1869, after having previously written about philosophy and the history of English literature, Taine gave a series of popular lectures on aesthetics and art history that he immediately translated and published as *The Philosophy of Art*. A self-declared follower of Comte, Taine described this work as "an application of the experimental method to art, in the same manner as it is applied to the sciences."⁹³ Taine claimed that he could account for the underlying laws of artistic production of a given culture in terms of environmental, social, and economic conditions, including the racial characteristics of the society and climate. Analogizing art to botany, he wrote that "Just as there is a physical temperature which by its variations determines the appearance of this or that species of plants, so there is a moral temperature which by its variations determines the appearance of this or that kind of art."⁹⁴ Taine thought that the application of his positivist system to art was beneficial because it presented no "standard of judgment" and "tends to emancipate the student of art, as well as the amateur, from metaphysical and sentimental theories growing out of personal sentiment or traditional fancies."⁹⁵ While Taine's experimental method should have led him into a rigid social determinism, these categories of analysis were sufficiently vague as to permit him to frequently diverge from the strictures of the experimental method. Many of his readers found it surprising, for example, that although his method appeared to be radically modern, it nevertheless produced a conservative defense of Beaux-Arts classicism. What an architect-historian like Ware may have found inspiring in Taine's *Philosophy of Art* was an attempt to explain artistic production within the full scope of social history, without recourse to mystifying sources like genius.

Ware cited Taine in several publications and in his personal correspondence with academic colleagues. Ware referenced "[Monsieur] Taine" and the idea of a "moral temperature" in his *Outline of a Course* of 1866.⁹⁶ The "moral temperature" was Taine's term for "the general state of mind and manners in a community" which set the enabling conditions necessary creative talent and genius to come to fruition. Years later, Ware also referred to Taine as a like-minded critic of traditional art education in a letter that he wrote to Edward MacDowell, a pianist and composer who from 1896 until 1904 established Columbia's Music Department. "If [students] are to perform their part in the dream that is presently to be enacted they must be something more than the gifted boors, destitute alike of high thoughts and of high feelings, which both here and abroad the present methods of training, as Taine long ago pointed out, are calculated to

produce.”⁹⁷ For the purposes of our discussion, what is important to recognize in Taine is an influential, widely-read intellectual whose empirical approach to the history of art and architecture would have encouraged Ware to resist the isolation of his discipline in the professional world of design, separate from the rest of the humanities.

Strictly speaking, Taine was not a philologist, but what was philological about his philosophy of art was the notion that through extended study, the scholar could grasp what Taine called the “master idea” or underlying law, in a work of art. Philologists sometimes described similar ideas in their references to a text’s “spiritual etymon” or “life-giving center,” which, once identified, radiated throughout the web of contextualization to illuminate the conditions of its production.⁹⁸ Friedrich August Wolf described this philological ambition as the achievement of a *lebendige Anschauung*, or “living intuition” of the past.⁹⁹ Here the tendency of the critical philologist to describe characteristics of a text with the utmost restraint intersected with the tendency of the historical-cultural philologist to indulge in the totalizing gestures of cultural history, to study the passing detail that imaginatively revealed the entire life world from which the text emerged.

In Ware’s curriculum at Columbia, this ambition to push one’s understanding of historic styles beyond precedent to an almost unconscious level of intuitive familiarity with the “spirit and character” of a line justified the many hours of graphic memory work that Ware and Hamlin assigned in their historical drawing courses on ancient, medieval, and modern ornament. Whereas in Ware’s advanced research seminars, fourth-year students learned to appreciate the wider context of a particular building or architectural element, in historical drawing courses students aimed to cultivate figural appreciation for place or period through a variety of free-hand drawing exercises, including “tracing, copying, graphical construction, graphical discussion, pen-work, brush-work, out-door sketching, and the study of the Orders” (FIGURES 39-41).¹⁰⁰ For example, in Ware’s description of how his students used tracing paper to study historic ornament, he wrote:

In a work of art, every line, besides shape and position, has a spirit and character of its own, and to seize and reproduce this is enough to occupy the beginner’s best intention. Even when, as is generally the case, a line needs to be perfectly even and uniform from end to end, and as it were, to possess no individuality of expression at all, this negative character is one which requires care to secure. The tracing paper thus relieves the student of responsibility for one-half his task, only that he may devote himself the more efficiently to the other half. At the same time the lines beneath his paper secure him from disaster, and this assurance gives him confidence and courage to attack the task which remains, a task which after all comprehends the main substances of the matter. For in the practice of tracing we require that the forms shall be as fully analyzed as if they were to be drawn from memory, and the lines made of as fine a quality as the student can command, and with as much purpose as if the work were a work of original design. Instead of crawling along the line, as a child works with his Transparent Slate, our men are taught to trace with the same animation and spirit as if the original were not immediately under their hand. They soon find that a tracing may

be as brilliant and effective as a copy. The only different is that there is great facility and boldness in the procedure and more accuracy in the result.¹⁰¹

The use of tracing paper and its very materiality encapsulated Ware's historicist pedagogy. As a translucent filter between the past and the present, it marked the transitional moment between the cultivation of a student's good taste, which involved a passive principle of recognition or assimilation, and training in artistic skill, involving an active principle of production. The tracing clearly was not meant to be a copy. In fact, in Ware's explanation, the imprecision of the tracing in comparison to the source image eliminated "the element of draughtsmanship," or its qualities as an artfully rendered image, that might distract a student from the underlying motives of the historical example—again, a way to encourage an intuitive appreciation of architectural principles rather than the visual imitation of the past.

Behind Ware and Hamlin's enthusiasm for the graphic study of history was the belief that style was an impersonal regularity, the very opposite of the unique mark of the artistic personality. In Hamlin's *The History of Ornament* (1916), like *The American Vignola* a text that derived from decades of teaching research seminars at Columbia, he described the history of ornament in evolutionary terms as "the record of the origin, growth, decay, succession and inter-relation of the various styles of decorative design."¹⁰² This implied that style, as recorded in the history of ornament, was not something that one created or possessed but possibly a "negative character," as Ware suggested in the passage above, that was transmitted across place and period in spite of its use by individuals. Tracing, which for skeptics was dull and mechanical, was for Ware and Hamlin a practice that was part of the labor of artistic inheritance, making their students more receptive to the subtle, perhaps not even articulable lessons of what was essentially a visual canon transmitted through print media.

The best record of tracing work from this period is an undated notebook of glued tracings made in fine black pen by Lucian E. Smith for one of Hamlin's history of ornament courses. Smith graduated from Columbia in 1901, studied at the American Academy in Rome from 1905 until 1906, and joined the office of Cass Gilbert when he returned to New York, where he likely worked on the design of the Woolworth Building. Smith's notebook includes tracings of plans, sections, elevations, vaults, ornamental details, glazing patterns, and a variety of other complex architectural elements from the thirteenth to the seventeenth centuries (FIGURES 42-45). Some of these tracings cite their sources, which include history books and museums: "Ferg" for James Fergusson's *History*, "Lübke" for Wilhelm Lübke's *Outlines for the History of Art* (first published in 1860, translated to English by Clarence Cook in 1878), "Moore" for Charles Herbert Moore's *Development and Character of Gothic Architecture* (1890), "SKM" for the South Kensington Museum, and "AA" for the Architectural Association in London. The tracings are a graphical record of the slow, somatic process of learning architectural history through careful observation. Some of them are relatively simple plans and sections of famous buildings like St. Peter's in Rome; others are intensely comparative, such as full taxonomies of molding in the Early English, Decorated, and Perpendicular Gothic styles.

Historical drawing was just one of several exercises in Ware's historicist pedagogy that the predominance of philology in the late-nineteenth-century American university helped to legitimize. From 1880 until 1900, the study of architectural history at Columbia was deeply embedded in the culture of classicism. After the turn of the century, McKim and other influential supporters of the Society of Beaux Arts Architects would ridicule "Uncle William" for emphasizing history at the expense of advanced design instruction. Although Hamlin preserved much of Ware's curriculum when he took control of the program in 1903, remaining interim head of the architecture program until 1912, by 1923 it was clear that student interest in history was on the wane. Students in that year submitted a list of grievances to William Boring, the program's new director, demanding that he condense or eliminate coursework in the history of architecture and ornament in order to free up additional time for studio. Boring, one of McKim's former assistants and an advocate of Pure Design, happily obliged, starting the process of minimizing historical study that Joseph Hudnut would eventually continue when he became dean in 1933.¹⁰³ But, once again, when enthusiasm for modernist abstraction overcame the study of architectural history in Columbia's School of Architecture, there was already a History of Art Department on campus (it was founded in 1921) and a bevy of other humanities departments that continued the liberal study of architecture within the university.¹⁰⁴

Conclusion:

Throughout the history of the collegiate system of architectural education in the United States, the meaning and evaluation of design has been a source of institutional marginality. In the period from 1880 until 1912, when Columbia's school of architecture was under Ware's leadership, the study of architectural history provided a source of institutional legitimacy. By combining the history of architectural education with the history of the American research university, including the history of legal education and classical studies, one can begin to recognize a variety of ways that Ware and his colleagues responded to new influences in the collegiate setting, such as the modern university's commitment to supporting different forms of research. While the centrality of historic precedent in Ware's curriculum linked the discipline to other kinds of professional instruction in which the use of case studies to identify precedents was of similar importance, philological methods of studying history also provided humanistic terms of engagement that connected the discipline of architecture to the rest of the American university's culture of classicism. Some of these connections were dependent on Ware's personal aesthetic philosophy and his social network, were thus unique to the development of the architecture school at Columbia. Others, however, became part of a historicist pedagogy that may have been replicated in other architecture schools around the country.

Architectural education's relationship to the cultures of professionalism and classicism was more than discursive; it also required a physical infrastructure. In this chapter I have focused on the articulation of shared values, concepts, and methods in discourse.

In the next, I will attend to the bibliographic resources at Columbia that made all of these disciplinary connections possible: the Avery Library.

Chapter Three: Endnotes

¹ “The basic problem with which the pioneers in architectural education were faced was two-fold. First, they had to devise the specific type of training that would prepare students for the unprecedented needs of this newly professionalized field; and second, it was necessary to construct the program of study in such a manner as to fit into the plan of the American university.” Arthur Clason Weatherhead, “The History of Collegiate Education in Architecture in the United States” (Columbia University, 1941), 66. Weatherhead’s two-fold problem is equivalent to the concept of “structural ambiguity” that I mentioned in the introduction to this section. See Note 56 of the previous section or Donald W. Light, “The Development of Professional Schools in America,” in *The Transformation of Higher Learning, 1860-1930: Expansion, Diversification, Social Opening, and Professionalization in England, Germany, Russia, and the United States*, ed. Konrad Hugo Jarausch (Chicago: University of Chicago Press, 1983), 346.

²² S. Giedion, *Architecture, You and Me: The Diary of a Development* (Cambridge: Harvard University Press, 1958), 100–101.

³ Henry N. Cobb, “Architectural Education: Architecture and the University: Walter Gropius Lecture,” *Architectural Record* 47 (September 1985): 27.

⁴ Mark Wigley, “Prosthetic Theory: The Disciplining of Architecture,” *Assemblage*, no. 15 (1991): 7–29.

⁵ The notion of the collegiate architecture student as an ontological problem stems from my reading of Howard Singerman’s analysis of the college art student. “Artists are an ontological rather than an epistemological problem; theirs is a question of being, rather than of knowing. In the professional school, as in the liberal arts college, the artist exceeds his education: the artist is precisely what is not educated.” *Art Subjects*, First edition (Berkeley, Calif: University of California Press, 1999), 22; James Elkins, *Why Art Cannot Be Taught: A Handbook for Art Students*, First Paperback Edition (Urbana: University of Illinois Press, 2001). Mark McGurl also confronts this basic question with respect to creative writing programs in Mark McGurl, *The Program Era: Postwar Fiction and the Rise of Creative Writing* (Cambridge, Mass.: Harvard University Press, 2011).

⁶ Robert Gutman, “Educating Architects: Pedagogy and the Pendulum,” in *Architecture from the Outside in: Selected Essays*, ed. Dana Cuff and John Wriedt (New York: Princeton Architectural Press, 2010), 273.

⁷ Weatherhead, “The History of Collegiate Education in Architecture in the United States,” 29.

⁸ “The College of Engineering and Engineering Experiment Station of the University of Illinois: A Pictorial Description,” *University of Illinois Bulletin* XVI, no. 19 (January 6, 1919).

⁹ Paul Louis Bentel, “Modernism and Professionalism in American Architecture, 1919-1933” (Massachusetts Institute of Technology, 1992).

¹⁰ Avigail Sachs, “Research for Architecture: Building a Discipline and Modernizing the Profession” (University of California, Berkeley, 2009); Avigail Sachs, “The Postwar Legacy of Architectural Research,” *Journal of Architectural Education* (1984-) 62, no. 3 (2009): 53–64. Sachs borrows the term “institutional matrix of inquiry” from the social historian Oliver Zunz, who uses it in Oliver Zunz, *Making America Corporate, 1870-1920*, Revised edition (Chicago: University of Chicago Press, 1992).

¹¹ Avigail Sachs, *Environmental Design: Architecture, Politics, and Science in Postwar America*, Midcentury : Architecture, Landscape, Urbanism, and Design (Charlottesville: University of Virginia Press, 2018).

¹² Arindam Dutta, ed., *A Second Modernism: MIT, Architecture, and the “Techno-Social” Moment* (Cambridge, Massachusetts: MIT Press, 2013). On the growth of the techno-social research model at Cambridge, see Sean Keller, *Automatic Architecture: Motivating Form after Modernism*, First Edition (Chicago: University of Chicago Press, 2018). The phrase “closed world” comes from Paul N. Edwards, *The Closed World: Computers and the Politics of Discourse in Cold War America*, Reprint edition (Cambridge, Mass. London: The MIT Press, 1997).

¹³ For a brief overview of the development of “social and cultural factors” in architecture, see J.T. Vanderburgh and W. Russell Ellis, “A Dialectics of Determination: Social Truth-Claims in Architectural Writing, 1970-1995,” in *Discipline Of Architecture*, ed. Andrzej Piotrowski and Julia Williams Robinson, First edition edition (Minneapolis: Univ Of Minnesota Press, 2000), 103–26.

¹⁴ Although it is not a historical study, for a comprehensive introduction to the various research methods used in architecture, see Linda N. Groat and David Wang, *Architectural Research Methods*, Second Edition (Amsterdam ; Boston: Wiley, 2013).

¹⁵ As mentioned in the introduction to Section II, these two different interpretations of eclecticism are discussed in Richard Guy Wilson, "Architecture and the Reinterpretation of the Past in the American Renaissance," *Winterthur Portfolio* 18, no. 1 (1983): 69–87; Richard W. Longstreth, "Academic Eclecticism in American Architecture," *Winterthur Portfolio* 17, no. 1 (1982): 55–82. Keith N. Morgan and Richard Cheek discuss the "architect-historians" in "History in the Service of Design: American Architect-Historians, 1870-1940," *Studies in the History of Art* 35 (1990): 61–75. They refer to Ware as "the initial American model for the architect-historian" (63).

¹⁶ "Romantic Historiography and the Paradoxes of Historicist Architecture," in *Nineteenth-Century Architecture: Volume III*, ed. Martin Bressani and Christina Contandriopoulos, vol. 3, Companions to the History of Architecture (Chichester, West Sussex; Malden, MA: Wiley-Blackwell, 2017), 81–82.

¹⁷ On the emergence of the American social sciences from the 1880s onward, see Dorothy Ross, *The Origins of American Social Science* (Cambridge ; New York: Cambridge University Press, 1991); Thomas L. Haskell, *The Emergence of Professional Social Science: The American Social Science Association and the Nineteenth Century Crisis of Authority* (Urbana: University of Illinois Press, 1977).

¹⁸ Burton J. Bledstein, *The Culture of Professionalism: The Middle Class and the Development of Higher Education in America* (New York: Norton, 1976).

¹⁹ Caroline Winterer, *The Culture of Classicism: Ancient Greece and Rome in American Intellectual Life, 1780-1910*, New Ed edition (Baltimore: Johns Hopkins University Press, 2004).

²⁰ Robert D. Andrews, "The Broadest Use of Precedent," *The Architectural Review* II, no. 4 (May 15, 1893): 36.

²¹ *A Study of Architectural Schools, 1929-1932* (New York: Charles Scribner's Sons, for the Association of Collegiate Schools of Architecture, 1932), 122.

²² Marvin Lazerson, "F. A. P. Barnard and Columbia College: Prologue to a University," *History of Education Quarterly* 6, no. 4 (1966): 53.

²³ On the history of the development of Columbia in the Barnard era, see Robert A. McCaughey, *Stand, Columbia: A History of Columbia University in the City of New York, 1754-2004*, First Printing (New York: Columbia University Press, 2003); Lazerson, "F. A. P. Barnard and Columbia College"; Stacilee Ford Hosford, "Frederick Augustus Porter Barnard: Reconsidering a Life" (Ed.D., Teachers College, Columbia University, 1991). Barnard is described as a "gradualist" reformer in Laurence R. Veysey, *The Emergence of the American University* (Chicago: University of Chicago Press, 1965). Veysey provides a classic account of higher education in the United States; for a more updated account, see also John R. Thelin, *A History of American Higher Education* (Baltimore: Johns Hopkins University Press, 2011). On the history of Columbia's professional schools, see Albert Richard Lamb, *The Presbyterian Hospital and the Columbia-Presbyterian Medical Center, 1868-1943; a History of a Great Medical Adventure*. (New York: Columbia Univ. Press, 1955); John Call Dalton, *History of the College of Physicians and Surgeons in the City of New York, Medical Department of Columbia College* (New York: The College, 1888); Julius Goebel, ed., *A History of the School of Law, Columbia University*, The Bicentennial History of Columbia University (New York: Columbia University Press, 1955); William P. LaPiana, *Logic and Experience: The Origin of Modern American Legal Education*, 1 edition (New York: Oxford University Press, 1994); Robert McCaughey, *A Lever Long Enough: A History of Columbia's School of Engineering and Applied Science Since 1864* (New York: Columbia University Press, 2014).

²⁴ Frederick A. P. Barnard, *Proceedings at the Inauguration of Frederick A. P. Barnard ... as President of Columbia College* (New York: Hurd and Houghton, 1865), 47.

²⁵ F.A.P. Barnard, "Columbia College as a University," *The American Journal of Education* 31 (1881): 250.

²⁶ Bruce A. Kimball, "Liberal versus Useful Education: Reconsidering the Contrast and Its Lineage," *Teachers College Record* 87, no. Summer (1986): 575–87.

²⁷ Joseph Le Conte, "The Essential Characteristics and Mutual Relations of the School, The College, and the University," *The Princeton Review* 5 (1880): 180.

²⁸ "The shift from conservation to searching portended great changes in the conception of academic freedom. As long as conserving was the foremost ideal, academic freedom was a freedom *for*, no *in*, the colleges. The conserver, taken as an ideal-type within the ranks of the men of knowledge, regards the knowledge inherited from the past as the seasoned wisdom of the race or the afflatus of God. As priest,

he celebrates it; as scholastic, he systematizes it; as fundamentalist, he applies it, reverencing *ipsissima verba* [the precise words]. The pre-Civil War academic, by filling all three roles, maintained a certain intellectual autonomy—a freedom and isolation as a member of the community of the education. In a New World, peopled by the uprooted, he kept alive a respect for traditions. In a democratic society, tending to be plebiscitarian in taste as well as in politics, he resisted the attempts of public whim and vulgarity to depreciate the college education. A good part of his opposition to a more secular university and a more vocationalized curriculum stemmed from his desire to protect very fragile values from the crush of a rough society. He sought the freedom not to acquiesce in the philistinism of his age...The advent of the searcher in academic life reversed the relationship and relative importance of inner and outer freedoms. Characteristically, the searcher regards accumulated knowledge as no more than lore and hypothesis, as fallible as the men who made it. He may be the religious reformer, who strips the veil of mystery from arcane symbols; the artist, who rebels against the academy's official vision, the philosopher, who seeks a new starting point for thought. In the new university that was to be born, the searcher was most often to wear the vestments of the scholar, seeking facts upon which to base new interpretations of the past; the social scientist, distinguishing what is myth and what reality; the physical and natural scientists, applying a disinclined test to current theories...Believing that progress was a social law, he would not only assume that tradition was mere opinion and experience, but that opinion improves as society ages and that experience grows stale with senescence." Walter Metzger, *Academic Freedom in the Age of the University* (New York, N.Y: Columbia University Press, 1961), 317–18.

²⁹ On the "investigative temper" of the late nineteenth century and the difference between antebellum and postbellum definitions of science, see Veysey, *The Emergence of the American University*, 133–48. He writes, "In the United States shortly after the middle of the nineteenth century, the meaning of the word 'science' began significantly to change. Before, any well-organized body of principles concerning any area of knowledge or speculation had been called science. Science connoted orderliness and system, in ethics no less than in geology. 'A science is a compilation of the laws of the universe on one particular subject,' Francis Wayland of Brown had said in 1830. 'Its progress is marked by the number of these laws which it reveals, and the multiplicity of their relations which it unfolds.' Thus understood, 'science' had a settled, preponderantly deductive air about it. The scientific approach to any topic was not considered to be the empirical approach; instead, the two were often contrasted. Empiricism implied an undesirable randomness of effort, a groveling among details which remained unrelated because larger theoretical schemes went unperceived. It was the task of science, in this older meaning, to overcome an unhealthy empiricism in the name of order. Such order, of course, constituted the unchanging reflection of the divine.

The older connotations of science did not disappear with the age of Darwin. The quest of law continued, and in such academic fields as philology and sociology the eagerness to produce a tidy catalogue of generalizations bespoke what long remained scarcely an empirical style of investigation. But at the same time the word 'science' came to be much more closely associated with specific evidence, and with evidence observed in nature, than had been true before." Veysey, 133–34. On the embrace of provisional rather than absolute notions of true in this moment in the history of the American university, the classic essay is Morton G. White, "The Revolt Against Formalism in American Social Thought of the Twentieth Century," *Journal of the History of Ideas* 8, no. 2 (1947): 131–52.

³⁰ William Watts Folwell, "Inaugural Address (1869)," in *University Addresses* (Minneapolis: H. W. Wilson, 1909), 16–17.

³¹ On the origins of an "Information Society" in late-nineteenth-century America, which I can only reference in passing, see James R. Beniger, *The Control Revolution: Technological and Economic Origins of the Information Society* (Cambridge, Mass: Harvard University Press, 1986); JoAnne Yates, *Control through Communication: The Rise of System American Management*, Studies in Industry and Society (Baltimore: Johns Hopkins University Press, 1989); Alfred D. Chandler and James W. Cortada, eds., *A Nation Transformed by Information: How Information Has Shaped the United States from Colonial Times to the Present* (Oxford England; New York: Oxford University Press, 2003); James W. Cortada, *All the Facts: A History of Information in the United States since 1870*, 1 edition (New York, NY: Oxford University Press, 2016).

³² LaPiana, *Logic and Experience*; Bruce A. Kimball, *The Inception of Modern Professional Education: C. C. Langdell, 1826-1906*, 1st Edition edition (Chapel Hill: The University of North Carolina Press, 2009).

³³ On the spread of Langdell's system to other universities, including Columbia, see Bruce A. Kimball, "The Proliferation of Case Method Teaching in American Law Schools: Mr. Langdell's Emblematic 'Abomination,' 1890-1915," *History of Education Quarterly* 46, no. 2 (2006): 192–247.

³⁴ White, "The Revolt Against Formalism in American Social Thought of the Twentieth Century," 147.

³⁵ On the history of medical education in the United States and the adoption of the case-method system at Harvard Medical School and Massachusetts General Hospital, see Kenneth M. Ludmerer, *Learning to Heal: The Development of American Medical Education*, Reprint edition (Baltimore: Johns Hopkins University Press, 1996); Kenneth M. Ludmerer, "Reform at Harvard Medical School, 1869-1909," *Bulletin of the History of Medicine* 55, no. 3 (1981): 343–70.

³⁶ Walter Doyle, "Case Methods in the Education of Teachers," *Teacher Education Quarterly* 17, no. 1 (1990): 7–15.

³⁷ Joel Isaac, "Making a Case: The Harvard Pareto Circle," in *Working Knowledge: Making the Human Sciences from Parsons to Kuhn* (Cambridge, Mass: Harvard University Press, 2012), 63–91.

³⁸ Peter Collins, *Architectural Judgement* (London: Faber, 1971), 21. On historicist thinking more generally, see Dorothy Ross, "Historical Consciousness in Nineteenth-Century America," *The American Historical Review* 89, no. 4 (1984): 909–28.

³⁹ William R. Ware, "The Study of Architectural History at Columbia College," *School of Mines Quarterly* 17 (November 1895): 61.

⁴⁰ On theories of composition and rhetoric invention in the nineteenth-century American college, see Professor James A. Berlin, *Writing Instruction in Nineteenth-Century American Colleges*, 1st edition (Carbondale: Southern Illinois University Press, 1984); Albert R. Kitzhaber, *Rhetoric in American Colleges, 1850-1900*, First Edition (Dallas, Tex.: Southern Methodist University, 1990); John C. Brereton, ed., *The Origins of Composition Studies in the American College, 1875-1925: A Documentary History*, 1 edition (Pittsburgh: University of Pittsburgh Press, 1996).

⁴¹ William R. Ware, "The Instruction in Architecture at the School of Mines," *The School of Mines Quarterly* 10 (1889): 31. On the Beaux-Arts theory of composition, see Colin Rowe, "Character and Composition; or Some Vicissitudes of Architectural Vocabulary in the Nineteenth Century," in *The Mathematics of the Ideal Villa, and Other Essays* (Cambridge, Mass: MIT Press, 1976), 59–88; David Van Zanten, "Architectural Composition at the Ecole Des Beaux Arts from Charles Percier to Charles Garnier," in *The Architecture of the École Des Beaux-Arts*, ed. Arthur Drexler and Richard Chafee (New York; Cambridge, Mass.: Museum of Modern Art; Distributed by MIT Press, 1977), 111–290.

⁴² Wilson was the first to identify these two contrasting approaches, the elemental and the prototypical, in his classic essay on scientific eclecticism. He writes, "While the buildings of the American Renaissance are never direct copies of European sources, one can observe two basic approaches to the composition of form. The first is a reliance on prototypes such as the Italian Renaissance palazzo that in America came to house a variety of building functions—houses, banks, clubs, offices, and museums. The origins of the specific prototypes of the Boston Public Library and the Villard houses are obvious, as has been noted, and yet neither is an exact duplicate of a particular Italian Renaissance building. Changes in details, combinations of motifs from different buildings, adjustments of scale and proportion, insertion of modern functions, and different spatial arrangements make them American buildings. The second approach to form can be called elemental and involved the creation of entirely new forms out of the basic elements of architecture rather than from prototypes. Pilaster, column, arch, arcade, wall, window, frame, atrium, cornice, attic—all were elements that could be composed to create a new building form. The Corcoran Gallery is an example; architect Flagg astutely studied both the confined site and the requirements of the museum—large areas of wall surface, organized sequence of galleries, and atriums—and produced a design original from that of any previous building and yet still partaking of the air of the Renaissance. Both the elemental and the prototypical approaches toward form had their origin in French Beaux Arts theory, but in the architect's wider eclecticism or great acquisitiveness of elements and forms and the intensity of his details, they became typically American." Wilson, "Architecture and the Reinterpretation of the Past in the American Renaissance," 85.

⁴³ Julien Guadet, *The Elements and Theory of Architecture: A Course of Lectures Given at the Ecole Nationale Et Spéciale des Beaux-Arts, France*, trans. John Galen Howard (Unpublished, 1907), 84.

⁴⁴ The first "Architectural Aberration" to be ignominiously featured in the *Architectural Record* was the Edison Building, designed by the well-known firm Carrère and Hastings and completed in 1891. "Architectural Aberrations: No. 1--The Edison Building," *Architectural Record* 1, no. 2 (December 1891): 133–36. On the founding of the *Architectural Record* and the state of architectural criticism in the United

States in the 1890s, see Susanne Ralston Lichtenstein, "Editing Architecture: 'Architectural Record' and the Growth of Modern Architecture, 1928-1938" (Ph.D., Cornell University, 1990), 17–65; Suzanne Stephens, "Architecture Criticism in a Historical Context: The Case of Herbert Croly," *Studies in the History of Art* 35 (1990): 275–87.

⁴⁵ H. Langford Warren, "The Use and Abuse of Precedent," *The Architectural Review* II, no. 2 (February 13, 1893): 11–15; H. Langford Warren, "The Use and Abuse of Precedent (Second Article)," *The Architectural Review* II, no. 3 (April 3, 1893): 21–25. Henry D. Bates and Thomas R. Kimball, two members of M.I.T.'s Architectural Society, started the *Technology Architectural Review* in 1887 to showcase outstanding student work and to inexpensively provide photographic plates of European buildings for precedent study. Ware contributed a set of five drawings to the first issue as a demonstration of his support for the endeavor. The editors renamed the journal *The Architectural Review* in 1902. Henry D. Bates, "The 'Inside Story' of the Founding of 'The Architectural Review,'" *Architectural Review (New Series)* 5, no. II (November 1917): 255–56. On Warren's career as an educator at Harvard, see Anthony Alofsin, "Toward a History of Teaching Architectural History: An Introduction to Herbert Langford Warren," *JAE* 37, no. 1 (1983): 2–7; Anthony Alofsin, *The Struggle for Modernism: Architecture, Landscape Architecture, and City Planning at Harvard* (New York: W.W. Norton, 2002); Maureen Meister, *Architecture and the Arts and Crafts Movement in Boston: Harvard's H. Langford Warren*, 1st ed (Hanover: University Press of New England, 2003).

⁴⁶ Warren, "The Use and Abuse of Precedent," 13.

⁴⁷ Warren, 13–14.

⁴⁸ Warren, 15.

⁴⁹ Warren, "The Use and Abuse of Precedent (Second Article)," 22.

⁵⁰ Warren, 22–23.

⁵¹ "Our conclusions may be briefly summed up as follows: Work that either from ignorance or on purpose attempts to dispense with precedent altogether, or which uses the forms of past art without an intelligent knowledge of their meaning, is necessarily not only ungrammatical, but incoherent, formless, ugly; it is to architecture what the gibbering of an idiot is to language.

On the other hand, work that is merely imitative of past art, which dares change nothing in the traditional forms, is unprogressive and abortive.

To make the practical requirements of a building yield in the least degree to the supposed requirements of artistic precedent is to make precedent the master instead of the servant, is to deliberately close the door to progress, and to stifle artistic life. To employ any architectural member without reference to its meaning and use, or to introduce any detail merely because it strikes the fancy, and not because it is appropriate, is to follow whim instead of trained artistic feeling, to prefer doggerel to poetry, and to be false to the central principle that underlies all true art. To wantonly change, merely for the sake of change, any form which has been perfected by centuries of development is not only foolishly to throw away the result of previous growth, but to cut one's self off from the continued current of artistic life which has flowed on almost without interruption from the earliest times." Warren, 25.

⁵² Henry Van Brunt, "To the Editors of The Technology Architectural Review," *Technology Architectural Review* I, no. 6 (April 15, 1888): 1; Henry Van Brunt, "The Power of Simplicity," *Technology Architectural Review* II, no. 6 (October 12, 1889): 31–32; Henry Van Brunt, "The Education of the Architect," *Technology Architectural Review* III, no. 6 (October 31, 1890): 31–33; Henry Van Brunt, "The Historic Styles and Modern Architecture (II)," *The Architectural Review* II, no. I (January 2, 1893): 1–4.

⁵³ Van Brunt, "To the Editors of The Technology Architectural Review," 1.

⁵⁴ Henry Van Brunt, "Greek Lines," *Atlantic Monthly* 7 (June 1861): 654–67; Henry Van Brunt, "Greek Lines (Cont.)," *Atlantic Monthly* 8 (July 1861): 76–88. On Labrousse and the Neo-Grec, see David Van Zanten, *Designing Paris: The Architecture of Duban, Labrousse Duc, and Vaudoyer*, First Edition (Cambridge, Mass: The MIT Press, 1987); Neil Levine, "The Romantic Idea of Architectural Legibility: Henri Labrousse and the Neo-Grec," in *The Architecture of the École Des Beaux-Arts*, ed. Arthur Drexler and Richard Chafee (New York; Cambridge, Mass.: Museum of Modern Art; Distributed by MIT Press, 1977), 325–416. Levine's contribution to the Drexler and Chafee anthology was based on his enormous, sprawling dissertation, still the most comprehensive treatment of the topic: Neil Arthur Levine, "Architectural Reasoning in the Age of Positivism: The Neo-Grec Idea of Henri Labrousse's Bibliotheque Sainte-Genevieve" (Ph.D., Yale University, 1975).

⁵⁵ Van Brunt, "The Power of Simplicity."

⁵⁶ Van Brunt, 32.

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- ⁵⁷ On the opposition of facts to figurative language, see Mary Poovey, *A History of the Modern Fact: Problems of Knowledge in the Sciences of Wealth and Society*, 1 edition (Chicago: University of Chicago Press, 1998).
- ⁵⁸ Van Brunt, "The Education of the Architect," 33.
- ⁵⁹ Ware, "The Instruction in Architecture at the School of Mines," 33.
- ⁶⁰ Ware, 33.
- ⁶¹ Ware, 33.
- ⁶² Herbert B. Adams, "Special Methods of Historical Study," in *Methods of Teaching History*, vol. 1, Pedagogical Library (Boston: D.C. Heath & Company, 1883), 113–48.
- ⁶³ William R. Ware, *The American Vignola; Part I, the Five Orders*, Second (Boston: The American Architect Company, 1903), 9.
- ⁶⁴ Ware, v.
- ⁶⁵ Marie Frank, "Emil Lorch: Pure Design and American Architectural Education," *Journal of Architectural Education* 57, no. 4 (May 1, 2004): 28–40; Marie Frank, "The Theory of Pure Design and American Architectural Education in the Early Twentieth Century," *Journal of the Society of Architectural Historians* 67, no. 2 (2008): 248–73.
- ⁶⁶ For a record of the resistance to precedent study by the members of the Architectural League, see the early volumes of *The Architectural Annual*, the League's annual journal, edited by the Philadelphia architect Albert Kelsey, and *The Brickbuilder*, which published the proceedings of the Architectural League's annual conferences. "Third Annual Convention of the Architectural League of America," *The Brickbuilder* 10, no. 6 (June 1901): 111–23. By 1901, the League apparently stopped using "Progress Before Precedent" as its motto. An anonymous editor wrote: "In the slow evolution leading to the inevitable birth and growth of American architecture, 'Progress Before Precedent' has played its little part. Used as a rallying cry during the formative period of the now permanently organized Architectural League of America—it did its work well—was referred to editorially as a maxim 'which contained much thought-provoking wisdom,' and elicited from the *Brickbuilder* an elaborate symposium which aroused a transcontinental discussion. It was never the official maxim of the League, though it still clings to it after having been officially repudiated; and we who know something of its paternity now bewail its fate with less reverence for the deceased than the old colored woman had who, at the age of 107, heard of the death of one of her sons aged eighty-eight, and sighing, said: 'Ah nevah quite expected to raise dat chile.'" Albert Kelsey, ed., "Progress Before Precedent," *The Architectural Annual*, no. II (1901): 31.
- ⁶⁷ H. Wayne Morgan provides a good introduction to the conflict between American modernists and traditionalist in *Keepers of Culture: The Art-Thought of Kenyon Cox, Royal Cortissoz, and Frank Jewett Mather, Jr* (Kent, Ohio: Kent State University Press, 1989). For a key traditionalist text that addresses the importance of precedent study in art and architecture, see Kenyon Cox, "The Illusion of Progress in the Arts," *New England Review* 25, no. 4 (2004): 202–7. Cox, who studied architecture and worked in the New York office of McKim Mead and White prior to becoming a critic, read this address before the joint meeting of the American Academy of Arts and Letters and the National Institute of Arts and Letters on December 13, 1912.
- ⁶⁸ Ware, "The Study of Architectural History at Columbia College," 56.
- ⁶⁹ Porter enrolled in Columbia's School of Architecture in the fall of 1904 as a special student and stayed until 1906, when he left for Europe to prepare what would become his monumental *Medieval Architecture* (1909). Much of the scholarly research that Porter completed for this work he completed at Columbia's Avery Library. In 1911, Porter published *Construction of Lombard and Gothic Vaults*. He was later associated with Yale and Harvard. On the influence of Ware's program on Porter, see Linda Seidel, "The Scholar and the Studio: A. Kingsley Porter and the Study of Medieval Architecture in the Decade before the War," *Studies in the History of Art* 35 (1990): 145–58.
- ⁷⁰ Ware, "The Study of Architectural History at Columbia College," 57.
- ⁷¹ A.D.F. Hamlin, "The Battle of the Styles," *Architectural Record* 1, no. 3 (March 1892): 275.
- ⁷² James Turner, *Philology: The Forgotten Origins of the Modern Humanities*, Reprint edition (Princeton, NJ: Princeton University Press, 2015), xi.
- ⁷³ Geoffrey Galt Harpham, "Roots, Races, and the Return to Philology," *Representations* 106, no. 1 (2009): 36.
- ⁷⁴ This best introduction to Wolf's revival of philology is in Friedrich August Wolf, *Prolegomena to Homer, 1795*, trans. Anthony Grafton (Place of publication not identified: Princeton University Press, 2014). On the distinction between "grammatical-positivist" and "cultural-historical" philologists, see Adi Efal, *Figural*

Philology: Panofsky and the Science of Things (London ; New York: Bloomsbury Academic, 2016); Adi Efal, "Philology and the History of Art," in *The Making of the Humanities*, ed. Rens Bod, Jaap Maat, and Thijs Weststeijn, Volume II: From Early Modern to Modern Disciplines (Amsterdam University Press, 2012), 283–300. On philology as an expression of German philhellenism, see Suzanne L. Marchand, *Down from Olympus: Archaeology and Philhellenism in Germany, 1750-1970* (Princeton, N.J.: Princeton University Press, 1996). On Nietzsche, see Friedrich Nietzsche, "On the Uses and Disadvantages of History for Life," in *Nietzsche: Untimely Meditations*, ed. Daniel Breazeale, trans. R. J. Hollingdale, Second edition (Cambridge; New York: Cambridge University Press, 1997), 57–124; Friedrich Wilhelm Nietzsche, "We Philologists," in *The Complete Works of Friedrich Nietzsche.*, ed. Oscar Levy, trans. J.M. Kennedy, Third, vol. 8, *The Complete Works of Friedrich Nietzsche* (Edinburgh and London: The Darien Press, 1911), 109–90; James I. Porter, *Nietzsche and the Philology of the Future*, 1 edition (Stanford, Calif: Stanford University Press, 2002).

⁷⁵ On the growth of agnosticism in the nineteenth century, see James C. Turner, *Without God, Without Creed: The Origins of Unbelief in America* (Baltimore: Johns Hopkins University Press, 1986). On market for high-cultural objects like intellectual magazines, see Lawrence W. Levine, *Highbrow/Lowbrow: The Emergence of Cultural Hierarchy in America*, The William E. Massey, Sr. Lectures in the History of American Civilization 1986 (Cambridge, Mass: Harvard University Press, 1990). The best account of the intersection of comparative philology and evolutionary biology in this period, including their co-development of tree diagrams as graphic conventions for representing genealogical models of linguistic and organismic speciation, see Stephen G. Alter, *Darwinism and the Linguistic Image: Language, Race, and Natural Theology in the Nineteenth Century* (Baltimore; London: Johns Hopkins University Press, 2003). For examples of Muller and Schleicher in American journals, see Max Müller, "Sacred Books of the East," *The North American Review* 128, no. 271 (1879): 631–46; review of *Review of Lectures on the Science of Language, Delivered at the Royal Institution of Great Britain in April, May, and June, 1861,*; *Die Darwinsche Theorie und die Sprachwissenschaft*, by Max Müller and Aug. Schleicher, *The North American Review* 101, no. 209 (1865): 434–74.

⁷⁶ For a helpful account of conflicts between philologists and generalists in the literary field, see Michael Warner, "Professionalization and the Rewards of Literature: 1875—1900," *Criticism* 27, no. 1 (1985): 1–28. Gerald Graff also discusses philology in Gerald Graff, *Professing Literature: An Institutional History, Twentieth Anniversary Edition*, Anniversary edition (Chicago: University of Chicago Press, 2007).

⁷⁷ Efal, *Figural Philology*, 3–4.

⁷⁸ Brooklyn Museum, *The American Renaissance, 1876-1917*. (Brooklyn, N.Y.; New York: Brooklyn Museum ; Distributed by Pantheon Books, 1979).

⁷⁹ Turner, *Philology*, xi. Ralph Waldo Emerson, *Emerson: Essays and Lectures: Nature: Addresses and Lectures / Essays: First and Second Series / Representative Men / English Traits / The Conduct of Life* (New York: Library of America, 1983), 447.

⁸⁰ Timothy P. Duffy offers a compelling account of how the different models of intellectual authority that Norton encountered over the course of his career were based on the gendered Victorian doctrine of the "separate spheres." See his Timothy P. Duffy, "The Gender of Letters: Charles Eliot Norton and the Decline of the Amateur Intellectual Tradition," *The New England Quarterly* 69, no. 1 (1996): 91–109.

⁸¹ Norton's architectural writing prior to publishing *Historical Studies* included popular articles on tenement housing. See Charles Eliot Norton, "Dwellings and Schools for the Poor," *The North American Review* 75 (April 1852): 464–89; "Model Lodging-Houses in Boston," *Atlantic Monthly*, June 1860, 673–80.

⁸² Ruskin's response to the publication of Norton's *Historical Studies* was telling. In a letter to Norton, he wrote, "When I first looked at your book I felt a chill from the tone of it (in the points you know of) far more than I ever feel, or could feel, in talking with you; but it will furnish me with just what I want of the most definite and trustworthy facts—and these carried with a little spice of old Jerome and Knox—as you know they are mixed in me—will give I believe, more of the zest of that old life than has yet been got in history." John Ruskin and Charles Eliot Norton, *The Correspondence of John Ruskin and Charles Eliot Norton*, ed. John Lewis Bradley and Ian Ousby (Cambridge; New York: Cambridge University Press, 1987), 447.

⁸³ Charles Eliot Norton, *Historical Studies of Church-Building in the Middle Ages: Venice, Siena, Florence* (New York: Harper & Bros., 1880), 12.

⁸⁴ Norton, 31.

⁸⁵ Louis E. Lord, *A History of the American School of Classical Studies at Athens: 1882-1942* (Cambridge, Massachusetts: Harvard University Press, 1947), 1.

⁸⁶ “First Annual Report of the Executive Committee, With Accompanying Papers: 1879-80” (Cambridge: Archaeological Institute of America, 1880).

⁸⁷ On the publishing history of Reber’s texts in English, see the prefatory comments in Franz von Reber, *History of Ancient Art*, trans. Joseph Thacher Clarke (New York: Harper & Brothers, 1882); Franz von Reber, *History of Medieval Art*, trans. Joseph Thacher Clarke (New York: Harper & Brothers, 1887). The excavation of Assos was led by Thacher and Francis H. Bacon, a graduate of M.I.T.’s School of Architecture in 1876. See Joseph Thatcher Clarke, *Report on the Investigations at Assos, 1881*, Papers of the Archaeological Institute of America (Boston and London: A. Williams and Co.; N. Trubner and Co., 1882).

⁸⁸ Turner, *Philology*, 320.

⁸⁹ Reber, *History of Ancient Art*, v.

⁹⁰ Reber, v. On Schnaase and the influence of Hegelianism on the art history surveys in the nineteenth century, see Mitchell Schwarzer, “Origins of the Art History Survey Text,” *Art Journal* 54, no. 3 (1995): 24–29.

⁹¹ James Fergusson, *A History of Architecture in All Countries: From the Earliest Times to the Present Day* (New York: Dodd, Mead, 1885), 46. For a general discussion of Fergusson’s life and his criticism of modern architects, see Robert Elwall, “James Fergusson (1808-1886): A Pioneering Architectural Historian,” *RSA Journal* 139, no. 5418 (1991): 393–404. Of course, Fergusson moderated his beliefs when he accepted a Gold Medal in 1871 from the Royal Institute of British Architects for producing histories that dignified the profession. Standing before an audience full of practitioners, he struck a more moderate chord: “My own advice would be, copy till you learn to appreciate and know what has been done, but when you begin to practice leave your copy-books and think for yourselves, and think only, for I feel convinced it is only when a man thinks he can arrange his building best and make it convenient for the purpose for which it is intended, and ornament it most appropriately for the age in which he lives.” James Fergusson, “Presentation of the Royal Gold Medal and Prizes,” *Papers Read at the Royal Institute of British Architects*, 1871, 147.

⁹² Some Americans new of Taine’s work as a philosopher and historian before 1864. Norton and Lowell, for instance, identified Taine as an up-and-coming European intellectual in “French Critics and Criticism.-- M. Taine,” *The North American Review* 93 (1861): 99–107.

⁹³ Hippolyte Taine, *The Philosophy of Art*, trans. Hippolyte Taine (London: H. Bailliere, 1865), vi.

⁹⁴ Taine, 33.

⁹⁵ Taine, vii.

⁹⁶ William R. Ware, *An Outline of a Course of Architectural Instruction* (Boston: John Wilson and Sons, 1866), 34.

⁹⁷ William R. Ware, “Letter to Edward McDowell,” February 25, 1902, MC14, Box 9, M.I.T. Archives.

⁹⁸ Gerald Graff points out the connection between Taine and American philologists in his account of the history of literary studies in the American university. He writes, “the historical studies of Hippolyte Taine were also widely invoked as a model by the early modern language departments. Like [August] Böckh, Taine conceived the object of historical science to be not a mere accumulation of disconnected data, but a search for the underlying unity that draws together the disparate aspects of a culture. Taine wrote that ‘it is a mistake to study the document, as if it were isolated.’ The historian, ‘if his critical education is sufficient...can lay bare, under every detail of architecture, every stroke in a picture, every phrase in a writing,’ the ‘master idea’ defining the characteristic tendency of a national culture at a given moment. According to Taine, ‘everything is a symbol’ to the historian, no cultural fact is without significance for the whole; therefore historical study can open ‘all the wealth that may be drawn from a literary work: when the work is rich, and people know how to interpret it, we find there the psychology of a soul, frequently an age, now and then of a race.’” *Professing Literature*, 70. Edward Said discusses the spiritual etymon in

⁹⁹ On Wolf’s concept of *lebendige Anschauung*, see Eyal, *Figural Philology*, 6.

¹⁰⁰ William R. Ware, “The Instruction in Architectural Drawing at Columbia University,” *School of Mines Quarterly* 7, no. 3 (April 1896): 227–28. See also William R. Ware, “The Instruction in Architectural Drawing at Columbia University (Concluded),” *The School of Mines Quarterly* 7, no. 4 (July 1896): 366–77.

¹⁰¹ Ware, “The Instruction in Architectural Drawing at Columbia University,” 227–28.

¹⁰² A. D. F. Hamlin, *A History of Ornament: Ancient and Medieval*, vol. 1 (New York: The Century Co., 1916), 10.

¹⁰³ On McKim's conflict with Ware, see Richard Plunz, "Reflections on Ware, Hamlin, McKim, and the Politics of History on the Cusp of Historicism," in *The History of History in American Schools of Architecture, 1865-1975*, ed. Gwendolyn Wright, Janet Parks, and Arthur Ross Architecture Gallery, Buell Center Books in American Architectural History, no. 1 (New York, N.Y: Temple Hoyne Buell Center for the Study of American Architecture and Princeton Architectural Press, 1990), 62. Pai mentions the 1923 list of student grievances in Hyungmin Pai, *The Portfolio and the Diagram: Architecture, Discourse, and Modernity in America* (Cambridge, Mass.; London: The MIT Press, 2006), 319–20. Students made the following suggestions: "(a) condense the history of ancient ornament; (b) eliminate the requirement for ornamental plates in the decorative arts; (c) eliminate the requirement for plates in the decorative arts; (d) eliminate historical research as a course and make it an elective; (e) drop stereotomy; (f) condense work covered in shades and shadows, descriptive geometry, and stereotomy; (f) condense work covered in shades and shadows, descriptive geometry, and stereotomy to one course; (g) condense graphics."

¹⁰⁴ On Hudnut and the minimization of history from the architecture curriculum at Columbia, see Jill Pearlman, *Inventing American Modernism: Joseph Hudnut, Walter Gropius, and the Bauhaus Legacy at Harvard* (Charlottesville: University of Virginia Press, 2007), 1–47. On the founding of the History of Art Department at Columbia, see Julius S. Held, "History of Art at Columbia University," in *The Early Years of Art History in the United States: Notes and Essays on Departments, Teaching, and Scholars*, ed. Craig Hugh Smyth and Peter M. Lukehart, Princeton Paperbacks (Princeton, N.J: Dept. of Art and Archaeology, PrincetonUniversity, 1993).

Chapter 4
Schooling Design:
The Avery Library and the Bibliographic Order of Collegiate Architecture

It was in death rather than life that Henry Ogden Avery (FIGURE 46) changed the fate of American architecture. Avery was a promising, well-connected New York architect who died unexpectedly on April 30, 1890 at the age of thirty-eight. His education was the best that an American of his time could have attained. He began his career studying under Russell Sturgis at the Cooper Union in the early 1870s before entering the *École des Beaux Arts*. In Paris, he joined the atelier of Louis-Jules André, successor to Henri Labrouste, who was then in the midst of designing France's Natural History Museum. Avery remained with André from 1874 until 1881, when he returned to New York to become an assistant in the office of Richard Morris Hunt. There he helped to design two palatial monuments of the Gilded Age: the W.K. Vanderbilt House and the Henry Marquand Mansion. As he settled into what promised to be a successful line of practice and entered competitions to support his own office, Avery became an active member of the architectural community and the growing art world of New York. He belonged to the New York Chapter of the A.I.A., the Architectural League of New York, the Society of American Artists (with sculptors and decorators like John La Farge and Louis Comfort Tiffany), and he also joined Ware and Norton on the board of the Archaeological Institute of America.

Avery's obituaries make it clear that he embodied for his peers the professional ideal of a modern architect. He was technically competent in the history and theory of design, a representative of a professional association, and clearly dedicated to the public interest.¹ One unnamed eulogist wrote:

The death of Henry O. Avery removes one of the few organizers and superior workers for the good of the profession at large. One of those who had high ideals of professional intercourse and work, whose time was always at the disposal of the Architectural League and other societies with which he was identified. His acquaintance with all the allied arts made his service valuable, he had great efficiency and ability in organizing and aiding all enterprises that tended to bring architects together and to inculcate an *esprit de corps*. At a time when so many think only of the almighty dollar, he sacrificed his own interest in service, and *service* is the hardest thing to get and the most valuable when so unselfish as was his.²

Two months after Henry Avery died, his parents, Samuel Putnam Avery and Mary Ogden Avery, presented Columbia with an endowment for a memorial architecture library in his honor. The timing of this gift, at a moment when Ware's liberal course of study had found a foothold within the university, was significant. Like an anchor, the Avery Library ensured that Columbia's architecture program would never drift too far

away from its historicist origins, even after Ware's retirement in 1902 and despite the increasing pedagogical importance of formal abstraction in subsequent periods of architectural education. In general, neither the growth of an Americanized Beaux-Arts curriculum from the turn of the century until World War I nor the Pure Design movement and the arrival of European modernism thereafter displaced architecture from its institutional location within American universities like Columbia, where the discipline remained in dialogue with the rest of the arts and sciences. It is because of this institutional location, as opposed to art academies and polytechnics, that the American architecture community, as Ware intended, diverged from its counterparts in Europe.

That Samuel Putnam Avery and his wife were able to memorialize their son with the gift of an architecture library was itself a testament to the growth of New York as a center for the international art market. Avery grew up in a different kind of city than the one that his son Henry knew. He apprenticed as a copper engraver after his father died in New York's cholera epidemic of 1832. In the late 1840s, he became wood engraver, supplying newspapers and magazines like the *Weekly Herald*, the *New York Herald*, and Horace Greeley's *Tribune* with images of battle scenes from the Mexican-American War (FIGURE 47). Later, he expanded his repertoire and sold literary illustrations to popular magazines like *Harper's Monthly*. In the 1850s, Avery began to buy paintings and fine books with the money he earned as an engraver. An insider to New York's art world who was on good terms with the members of the National Institute of Design and the artists associated with *The Crayon*, he built up his own collection while serving as a dealer for wealthy Americans who lived in other states. In the 1860s, Avery ended his career as an engraver and became a dealer full time. He hired purchasing agents in Paris and Dusseldorf, hosted auctions, and opened a gallery in Downtown Manhattan, selling more than 1,500 paintings to almost 400 people between 1864 and 1889, when he retired. His clientele included the highest echelon of New York society: August Belmont, A.T. Stewart, and the aforementioned William H. Vanderbilt.³ In retirement, Avery continued serve as a cultural benefactor. Between 1896 and 1900, he served as President of the Grolier Club, a library club for bibliophiles and fine bookmakers (FIGURE 48).

Avery's career, exceptionally successful as well as representative of New York's rise as a cultural capital, made the memorial to his son possible in more ways than one. When Henry died in 1890, Avery donated a \$50,000 gift to Columbia to create the architecture library, including funds necessary to build and outfit the library, his personal collection of about 400 rare art and architectural books, \$15,000-worth of new books that he acquired to fill out the collection, and another \$15,000 endowment for maintaining the collection and making new acquisitions. Avery's philanthropic "liberality," as nearly every newspaper report of the gift noted, provided material support for Ware's own liberal vision for the architecture profession.⁴ Social historians of the nineteenth century may often pit New England culture against New York commerce, as if books and money were unrelated to each other, but the Avery Library combined both kinds of class power (FIGURE 49).⁵ Having already begun to formulate a strong historicist curriculum throughout the 1880s, when the Avery gift arrived, Ware and his faculty were ready to put it to use.

The Avery Library helped to catalyze a reorganization of architectural knowledge that all but ensured that the discipline of architecture would be affiliated almost exclusively with the university and not with the wider array of educational institutions that dotted the nineteenth-century social landscape, including museums, vocational institutes, or the academies and private ateliers of the art world. As the historian and museum anthropologist Steven Conn has argued, at the time of the Avery's founding in the 1890s, American universities and American museums competed against each other to become the leading institution for the production and dissemination of new knowledge in American society.⁶ Collecting was an important battle line in this institutional competition between words and things. Universities built up the massive library systems for which they are now famous and, to a lesser extent, established teaching museums. Late-nineteenth-century art museums, in contrast, assembled large collections of plaster casts, including architectural plaster casts, to support researchers and teach the museum-going public the history of art and design. These reproduced objects of architectural knowledge, whether their interpreters thought that they embodied universal aesthetic standards or the historicity (i.e. relativism) of architectural form, connected the discipline of architecture to variety of intellectual worlds, including that of archaeology, the classics, the history of art, and to other modes of popular education, from public schools to drawing academies. Such connections to various social worlds pluralized the architect's intellectual authority and diversified the scope of architectural judgment. When museums began to remove architectural casts from their galleries around 1905, re-allocating their resources toward the collection of original masterpieces rather than the support of new research and popular education, they dissolved many of the relationships that were mediated by these objects, narrowing the field of architectural education to the university. Once there, architecture could, of course, make new alliances (my description of the influence of philology on Columbia's architecture program in this period is one example of a new alliance), but these alliances were predicated on new forms of social stratification that the university enabled. Before presenting the history of the Avery Library, I begin with the study of architecture in art museums so as to follow the epistemic shift from the inspection of physical objects to Columbia's bibliographic apparatus.

Learning from Casts: Architecture in American Museums Before 1905

Curators of European museums began to collect architectural plaster casts around 1850. One of the first substantial collections belonged to the celebrated English architect John Soane, who lined 13 Lincoln's Inn Fields, his home, with his own eccentric, subjectively-organized museum of architectural curios. At mid-century, many British architects, as well as visitors to Britain like Gottfried Semper, were swept up in the cult of ornament that followed the publication of books like Owen Jones' *The Grammar of Ornament* (1856). The Architectural Museum in London, founded in 1851 by the architect George Gilbert Scott, by 1855 contained more than 6,600 total objects, including 3,500 casts, including Venetian plaster casts that Ruskin donated. Scott's original idea for the Architectural Museum was to expose "art-workmen" to Gothic stone

carvings recovered during the restoration of English and Continental medieval churches, which the workmen could use as ornamental models for the decoration of contemporary projects.⁷ In 1857, James Fergusson, then the manager of the Crystal Palace in Sydenham, submitted his proposal for a *National Collection of Architectural Art*, a follow-up to the successful Architectural Courts at the Great Exhibition of 1851.⁸ This proposal eventually resulted in the opening of the Cast Courts in 1873 at the South Kensington Museum (now the Victoria and Albert Museum). For English visitors who had never travelled abroad, the Cast Courts were a sublime experience. They featured true-to-scale reproductions of monuments like Trajan's Column (FIGURE 50), the pulpit of Sant' Andrea, Pistoia, and the stupa of Sanchi. According to Tim Barringer, the Cast Courts presented the public with a "three-dimensional imperial archive."⁹ An entire "reproductive continuum" of photographs, electrotypes, and paper mosaics contextualized these plaster monuments within a global history of civilization.¹⁰ Flour writes, "While visitors felt overwhelmed as Gulliver in Brobdingnag, overshadowed as they were by these monumental structures, they could nevertheless take in at a single glance the masterpieces of world heritage and, as it were, grasp the world in microcosm."¹¹ For architecture students, the Cast Courts were an opportunity to study the play of light on modelled form, an approach to architecture that was more sculptural than graphic.

Not to be outdone by their English peers, curators of European museums also built up impressive plaster cast collections in the latter half of the nineteenth century. Viollet-le-Duc assembled the Musée de Sculpture Comparée in the Palais du Trocadéro in Paris in 1882. Art students at the École des Beaux-Arts studied architectural fragments in the courtyards of their school complex that the complex's former resident, the Musée des Monuments Français, left them behind. By 1863, students at the École could also study plaster casts in the Cour Vitrée of Duban's Palais des Etudes (FIGURE 6).¹² But unlike the display of fragments and plaster casts at the École, which could only suggest the still controversial Romanticist idea that modern art was the evolutionary product of past art, the collection at the Trocadero was properly and openly historicist, a "complete series" in which "the casts merged to produce an unprecedented panorama of a national architecture as an evolutionary continuum, and were intended to show a totality inaccessible in the fragmented reality of the quotidian world."¹³ Soon thereafter, many other museums in Europe, such as the Kaiser Friedrich Museum in Berlin (under the direction of Wilhelm von Bode) and the Glyptothek in Munich (under the direction of the archaeologist and philologist Heinrich Brunn) assembled comprehensive collections based on the modern art historical methods of chronology, comparison, style, and periodization. The rapid spread of museum cast collections throughout Britain and the Continent was facilitated by regulations like *The Convention for Promoting Universal Reproduction of Works of Art for the Benefit of Museums of All Countries* of 1867 and by suppliers working in private casting ateliers and in workshops associated with museums like the Louvre.

American museums began to collect comprehensive collections of architectural plaster casts around 1870. Before then, American art academies like the Pennsylvania Museum of Art collected small collections of sculptural casts to serve as drawing

models. Classicists also began to assemble university cast collections of busts and sculpture around midcentury.¹⁴ Only after 1870, however, did major metropolitan museums in Boston, New York, Philadelphia, Washington, Chicago, and Pittsburgh begin to assemble comprehensive cast collections for the purpose of teaching the history of the industrial and decorative arts. Born claims that “collections of casts were the central attraction in American museums between 1874 and 1905.”¹⁵ Wallach asserts that they were really “the order of the day.”¹⁶ This was certainly the case at the Art Institute of Chicago, which began to acquire plaster casts in 1884. In 1893, following the Columbian Exhibition and under the direction of the French National Committee on Historic Monuments, the Institute assembled a collection of architectural casts in Blackstone Hall (Figure 52). Art and architecture students from the School of the Art Institute and the Armour Institute of Technology, which combined in 1893, studied the Art Institute’s collection up until the 1920s.¹⁷ The Carnegie Museum of Art in Pittsburgh and the Cooper Union Museum of the Arts of Decoration also featured substantial cast collections.¹⁸

American enthusiasm for plaster casts can be explained by a number of factors. Casts were cheaper than original art works and most American museums lacked state funding; American archaeologists lagged behind archaeological powers like England and Germany for much of the nineteenth century and thus could not secure originals; it was harder and more expensive for the average Americans to travel abroad to see artifacts from the ancient, medieval, or Renaissance periods; and many American museums built up their collections after *The Convention for Promoting Universal Reproduction of Works of Art* had already passed and after the South Kensington model of educational museums had been established.¹⁹ Most importantly, curators and museum-goers both recognized that plaster casts represented the democratic mission of American art museums to educate the public.

The history of the plaster cast collection at the Boston Museum of Fine Art (BMFA), aside from being one of the earliest in the United States, is especially relevant to the history of architectural education because it involved curators and trustees who worked with Ware and likely influenced him. Charles Callahan Perkins, an advocate for the 1870 Drawing Act and the founder of the Massachusetts Normal Art School (Perkins and Ware worked together at the MNAS in the 1870s), was a trustee at the Boston Museum and perhaps the most vocal supporter of displaying reproduced works of art in American museums. Perkins believed that the American art museum, rather than aspiring to collect only masterpieces or works made by Americans, should serve the same function as the Greek temple and the medieval cathedral: to educate the public by presenting outstanding examples of the arts of design together. To do this, however, American would need to embrace the display of mechanically reproduced works of art, a policy that favored accuracy and the comprehensive scope of the collection over the originality of individual pieces. In an article that he published in Norton’s *The North American Review*, Perkins insisted,

That we shall have them [reproductions], and without the expenditure of immense sums of money there can be no doubt. Not, indeed, ideal and

impossible museums, filled with masterpieces of original art, but museums mainly composed of reproductions of statues, architectural fragments, monuments, gems, coins, inscriptions, etc., etc. These will answer our purpose, *as we aim at collecting material for the education of a nation in art, not at making collections of objects of art.* That must be done at a later stage of national reproductions, when we are willing to pay for them. As our museums must be filled with reproductions, pictorial art can for the present be but scantily represented in them, for good copies of pictures are rare and very costly. A good cast of an antique statue, the impress of a coin or a gem in plaster or Sulphur, is a *fac-simile* as far as form is concerned, but the copy of a picture is an image of the original reflected through the mind of the copyist, and more or less imbued with his personality,--either it is defective in expression, drawing, or coloring, and in some of these particulars likely to lead the student into error.²⁰

Perkins favored accuracy over originality because he understood works of art to be pedagogical instruments rather than precious art objects. He never imagined art museums as the grand treasure houses that they became later in the Gilded Age, supported by large endowments and wealthy private donors. Instead, Perkins envisioned the future of art museums as public extensions of universities, which he could see were entering a period of rapid expansion.

We cannot hope to find [support] at Washington, nor in our State governments (though these may eventually aid us by making the study of drawing obligatory in the public schools), nor can we look for it in unassisted individual action, which must be limited and comparatively feeble. Our only hope lies in the stronger action of universities and educational institutes. Harvard and Yale, by founding art professorships, and by aiding art projects to the extent of their ability, may put into willing hands the lever with which to move the American world. We look to them for aid as we look to no other source, because we know that they can most reasonably be expected to understand the importance of the work which art museums and schools of design are capable of accomplishing. Our hope for the success of the proposed museums of Art in Boston, for instance, is mainly grounded upon the consent of its educational institutions to take an active part in its government, and to loan it their art collections. If art is a unit, so is education; the cause of cultivation is one, and whether we labor for it through letters or through art, we are equally serving the same noble end.²¹

When the BMFA opened in 1876, it possessed a small collection of casts that it inherited from the Boston Athenaeum, 50 cases of casts that curators bought from England, and 30 architectural casts of the Alhambra that were made for the 1876 Centennial Exhibition in Philadelphia. By 1890, under the resourceful leadership of Edward Robinson, a curator who had learned the value of a well-displayed cast collection while working at the small but innovative Slater Museum in Norwich, Connecticut, the BMFA owned “777 plaster reproductions, the third largest collection in the world after the Royal Museum in Berlin and the Strasbourg University Museum.”²²

Soon, however, the liberalizing mission of the educational sector and the world of the fine arts began to separate. When curators began to box up boundary objects like plaster casts and put them in storage, the unified arts of design fractured and an interstitial discipline like architecture was momentarily caught between two different worlds. In an about-face from the spirit of art education reform in the 1870s, Matthew Stewart Prichard, an English barrister and antique dealer who represented a new, cosmopolitan cohort of wealthy trustees at the BMFA, wrote, “Casts are engines of education and should not be shown near objects of inspiration. They are data mechanically produced; our originals are works of art. The museum has reached a point in its development that warrants the attention of strangers; they come for what we have collected ourselves, not for the trite reproductions such as is the stock in trade of every ready-made museum of art. My plea, then, is that in the new building our galleries should be freed of casts, and that the museum should become—a gem in fair setting—a museum of works of art.”²³

The same conflict between supporters of plaster casts like Robinson and supporters of original works of art like Prichard played out at New York’s Metropolitan Museum of Art in the period during which Ware directed Columbia’s architecture program. When the Metropolitan was incorporated in 1870, its charter professed a broad commitment to “encouraging and developing the study of the fine arts, and the application of arts to manufactures and practical life, of advancing the general knowledge of kindred subjects, and, to that end, of furnishing popular instruction and recreation.”²⁴ In 1876, curators at the Met were confident enough in their fulfillment of this commitment as to state “the Museum today is not surpassed as an educational power among the people by *any* university, college, or seminary of learning in the metropolis.”²⁵ When the Met moved into its new Central Park building in 1880, designed by Calvert Vaux and Jacob Mould, Joseph H. Choate announced at the building’s opening ceremony that the museum would pursue a comprehensive collection along the lines of the South Kensington model. The directors, Choate declared, intended to “gather together a more or less complete collection of objects illustrative of the history of art in all its branches from the earliest beginnings to the present time, which should serve not only for the instruction and entertainment of the people, but should also show to the students and artisans of every branch of industry, in the high and acknowledged standards of form and color, what the past has accomplished for them to imitate and excel.”²⁶ In 1883, the Met received a bequest for \$100,000 from Levi Hale Willard to purchase architectural casts. Napoleon LeBrun of the New York Chapter of the American Institute of Architects chaired the initial Willard Architectural Commission and sent his son, Pierre, to Europe in order to find suitable copies of architectural fragments on the Commission’s behalf. Robinson, still working at the BMFA and before he moved to the Met permanently in 1905, directed the Met’s 1892 “Special Committee” to enlarge its cast collection, which included a proposal for the Met to establish a casting atelier of its own in order to supply other American museums with reproduced objects at a faster and cheaper rate than European competitors (FIGURE 53).²⁷ Samuel P. Avery, Stanford White, and Charles F. McKim were all donors to the campaign. By 1908, the Met’s *Catalogue of the Collection of Casts* included 2,607 items from throughout the ancient world and medieval and Renaissance Europe. Nobel writes, “the casts ranged in size from a kneeling Egyptian

official only a few inches tall to a life-size reproduction of the entire façade of the Porch of the Maidens of the Erectheum on the Athenian Acropolis.”²⁸ Columbia students and architects from throughout New York’s professional scene studied this collection, oftentimes during the Met’s special evening hours.

Despite the public popularity and professional support for the Met’s cast collection, once J.P. Morgan became the museum’s third president in 1904, it was doomed, like cast collections in Europe, to obsolescence. Flour identifies two possible reasons for the rapid decline of cast collections in British museums after the turn of the century: first, the passing of Victorian interest in ornament and decorative form and second, the emergence of a modernist culture of authenticity that, in the immortal words of Adolf Loos, condemned ornament as crime.²⁹ At the Met, though, the explanation was more straightforward: money. According to Tomkins,

With Morgan’s assumption of the presidency, the concept of the museum underwent a fundamental change. No longer would the Metropolitan defer to European institutions, or limit itself to the utilitarian and educational ideals of the South Kensington Museum. Casts, reproductions, and second-rate works of art might still retain some usefulness for artisans and students, but the emphasis had shifted unmistakably to the great and original masterpieces, the treasures that old Europe proved only too willing, after all, to relinquish. All this was spelled out clearly in the museum’s thirty-fifth annual report, covering the year 1905. In the past, the report stated, the museum had accepted many gifts, ‘which may sometimes have included objects hardly worthy of permanent display.’ From now on, however, it would ‘rigorously exclude all which do not attain to acknowledged standards.’ The trustees’ principal aim for the future was ‘not merely to assemble beautiful objects and display them harmoniously, still less to amass a collection of unrelated curios, but to group together the masterpieces of different countries and times in such relation and sequence as to illustrate the history of art in the broadest sense, to make plain its teaching and to inspire and direct its national development.’ To a sensitive observer, the change could be felt in the very atmosphere of the place. ‘Acquisition—acquisition if need be on the highest terms—may, during the years to come, bask here as in a climate it has never before enjoyed,’ Henry James wrote in 1907, in the section of *The American Scene* that dealt with the Metropolitan. ‘There was money in the air, ever so much money—that was, grossly expressed, the sense of the whole intimation. And the money was to be all for the most exquisite things—for *all* the most exquisite things except creation, which was to be off the scene altogether; for art, selection, criticism, for knowledge, piety, taste...The Museum, in short, was going to be great...’³⁰

It was at this point, around 1905, that American art museums ceased to make a meaningful contribution to the professional education of architects. Of course, architecture still played a role in the life of museum display. For instance, the use of interior architecture to help frame decorative art collections in the period rooms was an important innovation of the 1920s.³¹ And in 1925, John D. Rockefeller, Jr. donated the

funding necessary for the Met to acquire and transplant an assemblage of five French Romanesque and Gothic monasteries known as The Cloisters. These examples, though, served curators as a means of re-engaging the public, not aspiring professionals. Once American art museums concentrated on collecting only original masterpieces, a division of pedagogical labor set in that lasted for much of the twentieth century.³² Museums offered the public architectural enrichment while university departments of architecture took control of professional training and advanced research.

Ware's pedagogy followed this general shift in the organization of architectural knowledge from reproduced objects to books. As Wigley has observed, when Ware began M.I.T.'s school of architecture in the 1860s and 1870s, his students were immersed in a collection of architectural fragments that filled the Rogers Building. Based on photographs of Rogers Hall taken in the 1870s (FIGURE 54), Wigley writes, "While the walls of the lecture rooms were covered with drawings and projected lantern slide images, those of the drawing and design rooms were lined with photographs, prints, drawing, casts, tiles, stained glass—every type of representation that had been collected. These objects packed together systematically so obscured the walls that the collection became the walls, defining, subdividing and rearranging the space."³³ For Wigley, the display of architectural reproductions throughout Ware's young department functioned as disciplinary insulation. "This fetishistic layering of worshipped objects acted as a kind of defense, protecting architecture from the claim that might come from below that design is not scholarly, that the prosthetic extension [i.e. the discipline], in the end, does not really belong in the university."³⁴ Of course, one could just as easily come to the opposite conclusion: that the systematic display of these fragments was meant as an outward indication that the discipline was deeply engaged with many of the same theories and pedagogical techniques found elsewhere on campus, such as the study of evolutionary forms and precedents.

Ware continued to collect architectural fragments for pedagogical purposes after his move to Columbia. In 1892, Ware worked alongside Robinson on the Met's "Special Committee" as an expert in architectural casts. In the fall of 1898, the School of Architecture moved from Columbia's old 49th Street campus to Havemeyer Hall on Morningside Heights, a four-story building designed by McKim. Columbia's Chemistry Department occupied the first three floors of Havemeyer while the fourth floor and attic belonged to the architects. In the attic to the building, Ware installed an architectural museum. Although no photographs of the museum installation in Havemeyer have been located, Ware provided a detailed description of it. With all the excitement one usually feels for a new facility, he wrote that the museum included,

A number of models of framed buildings, roofs, floors and so forth, with full-sized details and specimens of building materials and appliances, hardware and iron work, and of different kinds of woods. Besides a quantity of modern American English glass and tiling, there are fragments of medieval glass work some of which came from the original windows of *Sainte Chapelle*, half a dozen Saracenic windows in glass and plaster from houses and mosques in Cairo, and a quantity of Moorish and Spanish tiles from a dismantled monastery in Seville.

These collections are constantly increased by gift, the manufacturers of useful and of decorative work being equally helpful in contributing to these stores.

The Roman casts, ancient and modern, from fragments of temples and from the Villa Madama, presented by Mr. C.F. McKim in 1891, which were scattered about on the walls of various rooms in Forty-ninth Street, are now effectively exhibited in the eastern draughting-room. The larger pieces make a fine show in the Museum above. These comprise a cast, eight or ten feet long, from the frieze of the Temple of Antoninus and Faustina, a similar fragment from the Forum of Trajan, and the great alto-relievo of the *Suovetaurilia*, from the voting place in the Roman Forum.

They are appropriately surmounted by a relief of a Roman eagle within a wreath, also from Tajan's Forum, and are flanked by casts of the two lions now in the Loggia dei Lanzi, at Florence, one of which is antique, the other a companion piece modelled by Flaminio Vacca. The glazed sashes in the ceiling of the corridor beneath have been removed, resembling the corridor to the atrium of a Pompeian house, so that these things are partially discerned from below.³⁵

The Havemeyer collection, a mixture of copies and antiques, was quaint but scattershot; a far cry from a museum collection, although it approximated the same logic. Ware was making the most out of limited resources, citing pieces in his description from around the world and in various periods of history, but he was unable to account for massive lacunas. Within two years, though, architecture at Columbia would enter into a new phase of institutional development.

The Order of Books: From the Avery Alcove to Avery Hall

A bas-relief memorial of H.O. Avery, sculpted in bronze by the highly-acclaimed French medalist Jules-Clément Chaplain, was presented to Columbia in 1893 by Mr. and Mrs. Samuel P. Avery and hung on the wall of the Avery Alcove (FIGURES 55-56). In the memorial, also the frontispiece to the Avery's 1895 Catalog, an allegorical figure of a woman in a draped gown sits on top of a Corinthian capital, beneath the branches of a sapling—a symbol of vitality and hope—one of which crosses in front of an ornamented gabled pediment. In her hands is a scroll (presumably of a drawing) and a drafting caliper, the iconography traditionally used to indicate that the subject of a portrait was an architect.³⁶ What is missing from Chaplain's image is any reference to the unusual space surrounding the memorial, a space devoted to the cultivation of architectural judgment through an encounter with print media. The French architectural world that Chaplain knew was not the same as the American architectural world that Avery's memorial would help to engender.

We know that throughout the eighteenth and early-nineteenth centuries, gentlemen-architects collected books as sources of information and inspiration while builders and amateur designers used pattern books to construct houses. Libraries were part of the infrastructure of professionalism insofar as they provided their owners with historic precedents for contemporary designs. Hafertepe and O'Gorman write, "In the

eighteenth century, book learning acted as a mark of the gentleman designer; in the nineteenth, the library—like the present license of the lawyer, doctor, or architect displayed on an office wall—became one badge of the owner’s qualification to undertake the work to be commissioned.”³⁷ We also know from Hitchcock’s inventory of American architecture books and Reiff’s subsequent analysis that the rate of publication in this area of architecture and design increased substantially in the postbellum period (FIGURE 57).³⁸ The increase can be attributed to a number of different factors that were not at all particular to the social history of architecture, including the availability of cheaper paper with the development of chemically-treated wood pulping, the development of professional journals and trade magazines in the 1870s and 1880s, and the growing market for architectural literature in different regions throughout the country. Once a mark of distinction earlier in the century, reading books and consulting journals later became a quotidian part of the American architect’s continuing education.

One of the ways that architects experienced and reflected upon the new, rapidly expanding world of print media was by designing libraries alongside professional librarians. Ware and Van Brunt made an important contribution to this process in 1877, when they completed the east wing addition to Harvard’s Gore Hall.³⁹ Ware, Van Brunt, and Justin Winsor, Harvard’s new head librarian, devised and implemented the iron book stack construction system to accommodate the university’s growing research collection. Afterwards, Ware was considered an expert on the construction of book stacks and served as a special advisor to the design of the New York Public Library and its stack system. Another innovative library design, based on the established typology of the train terminal, with its grand monumental front and industrial platforms, was Frank Furness’s infinitely “expandable” library for the University of Pennsylvania.⁴⁰

As architects considered how libraries might store and circulate print media in the future, they also learned to become readers, or at least book users. By 1890, when the office of nearly every professional firm included its own library, acquiring a bibliographic orientation became an important stage in the socialization of young architects to their disciplinary tradition. Periodicals like *The American Architect and Building News* published purchasing guides entitled “The Best Twenty Books for an Architect’s Library,” while in *Architecture and Building*, an 1893 article appeared that explained how one should read an architecture book and work in a library, as well as suggesting to readers important titles.⁴¹ Like many other British architects, the author, Thomas Roger Smith of the Royal Institute of British Architects and University College, London, recognized that the mechanisms used to organize the profession, such as licensing examinations, “drove” young designers to the study of books, whether they liked it or not. While those architects steeped in arts and crafts ideology resisted the new bibliographic order, Smith encouraged his students to regard the discipline’s print media with affection. “Try to find in your own little shelf full of well selected and well-used books a party of dear and intimate, well instructed friends...and in the collection of the larger libraries which you may consult, a group of erudite and valued auxiliaries, toward whom you entertain the warmest feelings of respect and gratitude,” he wrote, acknowledging that reading books demanded not only literacy but a certain kind of sociability, a genuine interest in architects and writers who one would likely ever know

through the printed page. “If you can come to the state of mind of having a warm affection for a book, you have secured the best possible guide to your use of it.”⁴² For the most part, American architects regarded the rapid increase of architectural literature in the postbellum period as a boon to the profession, but as we will see, there was a vocal minority that took exception to being driven into the bibliographic order.

Like those museum curators who assembled America’s great plaster cast collections, the committee in charge of building-up, categorizing, and administering the initial 13,000-book collection for the Avery Alcove aspired to be encyclopedic. George H. Baker, Columbia’s head librarian, Ware, and Russell Sturgis, in fact, said as much in their introduction to the 1895 Catalog (FIGURE 58), which was distributed “to architects, students of art, and other persons or institutions to whom the Avery Architectural Library may be useful.” Expressing a will to total knowledge and control, the committee members wrote:

It was the purpose in gathering the Avery Library to collect the material out of which, first, any historical question concerning the development of any form of architecture or the architecture of any land or period could be successfully studied, together with the architectural development of any important building or locality: and in the second place, to establish a storehouse in which architects and art-workers might find almost infinite resources of suggestion and inspiration for their work. Hence, historical architecture, rather than an accumulation of treatises on mere construction characterizes the library. From this position it was but a step to archaeology, and the collection is very rich in all those departments of archaeology which deal with architecture, sculpture, and the other decorative arts. Supplemented in some degree by the general library, it contains sets of nearly all the architectural periodicals and many of those devoted to art and archaeology, as well as the transactions of societies in these fields.⁴³

As was often the case in Ware’s writing, the key word in this passage was “mere,” an indication of a presumed epistemological hierarchy. “Mere construction” suggested a normative distinction between professional knowledge and the technical, always-changing information that a practitioner might simply access whenever necessary. The Avery included “the newer standard works on construction in all its details, including ventilation, heating, and lighting,” but not much more. “To go farther into the field of scientific construction,” the Committee wrote, “would be to make rather a library of engineering, than one of architectural fine art.”⁴⁴ Students of Columbia’s architecture school had privileged access to the Avery’s holdings because as readers it was presumed that they would be capable of an inspired response to precedent, and therefore real authorship, unlike the aspiring engineer in the materials laboratory, the carpenter on the job site, or the draftsman in the night school, who could not be trusted to prevent themselves from mindless copying. It was a commonplace of Victorian thought that every social type had its particular place in the world and the professional student belonged to the quiet, contemplative space of the university library. “Mere” indicated another normative judgment as well, one about different classes of print media that the reference to “an accumulation of treatises” signified. The Avery Committee

evidently considered the paperback pattern books, drawing books, and technical manuals to lack the power of cultural legitimacy. Disconnected from a rigorous curriculum, they were unable, the Committee members presumed, to provide a liberalizing education.

Unlike the architectural museum that Ware installed in the attic of Havemeyer, the organization of the Avery Library followed what were then the most modern bibliographic standards. This was in large part because Baker, Ware, and Sturgis received assistance from colleagues in Columbia's School of Library Economy, established in 1887 by Melvyl Dewey. The Avery Committee decided to classify the library's card catalogue by subject and author and to organize the books on shelves according to subject. The 1895 Catalog only included author and title entries because Harriet B. Prescott, an 1889 graduate of Dewey's school who for many years was in charge of Columbia's cataloging office, had not yet completed the subject classification (FIGURES 59-60).⁴⁵ The subject-scheme included a large section (Section D) on the various schools in the history of architecture, and it also identified some specific typologies, such as churches, houses, factories, and bridges, but mainly the scheme mapped architecture's relationship to other decorative and industrial arts. Section H on "Local" architecture, including books on the architecture of specific national traditions and individual cities, the Committee thought merited special attention.

Where this library compares most favorably with any other is in its richness in treatises on local architecture, by which is meant the monographs and descriptive works concerning the architecture of individual towns, districts, and regions, and important single buildings. These collections relating to local architecture may vary from a single monograph of a few pages about some ancient fragments built into a later building, to the whole body of memoirs of a local society, and also to the scores of volumes, including many hundreds of plates, which describe the architecture of Paris or Rome.⁴⁶

Section H suggests that the world history of architecture, once encapsulated by the single-volume tomes of Fergusson and Fletcher, was by 1895 growing ever more specific, descending into the particularities of distinct locales. Few individuals or firms would have been able to assemble a collection at this scale of local detail; it was a luxury of the university.

The 1895 Avery catalog represented an ideal order of architectural knowledge; in reality, the initial phase of systematic acquisition was followed by a steady stream of unsolicited donations in a variety of media formats. While museums boxed up their plaster casts and put them in storage, the Avery served as a repository for New York's architectural *disjecta membra*. Archived memoranda and correspondences of Edward Robinson Smith, the Reference Librarian of the Avery from 1893 to 1915, include numerous anecdotes about unsolicited donations, only some of which the library could afford to accept because of processing expenses. For example, in a two-page letter from Smith to Samuel Putnam Avery Jr., Henry O. Avery's older brother, dated September 22, 1913, Smith mentions the possibility of four new acquisitions: a man

wanted to “drop off” 7,000 photographic prints before going to Europe for his wedding trip; the American son of a recently deceased owner of an English pottery works offered a library of fine books on ceramics valued at \$30,000, provided that the Avery could cover the costs of transatlantic shipping; the Goodyear collection of photographs of architectural refinements, which were sitting “practically useless in the Brooklyn Museum,” were available for student use if faculty were interested; and the New York architect Whitney Warren was offering the school his collection of French engravings of European buildings. “We will take things as they come, quietly,” Smith wrote, reassuring Avery Jr.⁴⁷ Smith was a scholar in his own right—at his death, Hamlin referred to Smith as “the most widely-informed scholar in the country on the whole field of the fine arts”⁴⁸—and it was his responsibility, based on his own discretion, to integrate these gifts with the library’s annual purchases. By maintaining a balance between opportunism and long-term planning, the library would avoid the appearance of random aggregation and project an image of systematic disciplinarity.

The idea of the architecture library and its conceptual organization as a catalog should not overlook the fact that books are things and that libraries are a significant part of a research university’s physical capital. As a departmental library that facilitated advanced scholarly research, the Avery helped to advance the modernization of Columbia.⁴⁹ During the same decade in which Columbia College received the Avery donation, it also received donations for departmental libraries in law, the natural sciences, and the Teachers College, while aggressively acquiring materials and updating circulation policies for the central library.⁵⁰ Within the *longue durée* of the university, the physical entrenchment that this modernization movement demanded was more than a matter of additive growth; it fundamentally altered the university’s character. As James O’Gorman has written about the medieval university, the “lack of physical possessions was considered an asset,” since by avoiding the need for buildings and books, the *studium*, or the society of scholars and students who gathered in a particular place for study, remained independent from civil and religious authorities.⁵¹ For Columbia to incorporate architecture and other specialized disciplines within its institutional purview, it had to settle down. McKim’s Beaux-Arts plan for the Morningside Heights campus uptown was, in this sense, both a monumental expression of Columbia’s cultural ambitions near the turn of the century and a necessary means for spatially organizing the increasing amount of information processing and research that was now taking place on campus.⁵²

The Avery Library was installed in three different spaces. First, in a room arranged by the New York architect Charles C. Haight on 49th Street. Second, after 1898, in the Low Memorial Library on Morningside Heights. And third, after 1912, in Avery Hall. The interior architecture of these three spaces is notable for the different ways that they addressed what Breisch refers to as “a fundamental conflict” in the library architecture of the late nineteenth century “between an obsession with efficiency and utility and a nostalgic, at times reactionary yearning for the sentimental reassurance of the past.”⁵³ Initially, the design of the Avery demonstrated a strong relation to the Victorian “cult of mourning.”⁵⁴ It was a memorial, after all. Over time, though, and with each of the next two installations, the preoccupation with efficient circulation of the collection would grow stronger.

Haight's initial design for the Avery (FIGURE 61) emphasized nostalgia over efficiency. His arrangement of the library as a series of alcoves was a reference to Sir Christopher Wren's design for the Trinity College Library at Cambridge, constructed 200 years prior, as well as the Humfrey and Merton College shelf libraries at Cambridge, where the books were originally chained to their cases to prevent theft. Architects of public library buildings of a similar size to the Avery conscientiously avoided the alcove layout because it made it difficult for librarians to maintain visual oversight of their holdings and because it wasted square footage that a stack system could maximize.⁵⁵ The fact that the layout of the Avery blatantly ignored research in good library economy and design—and there was certainly a large amount of research on this topic by 1895—may have made it more distinct as a space of cultural privilege. Repeatedly, onlookers commented on the “medieval” quality of the space, but without specifying what caused this mental association. “A little place it was,” Edward R. Smith wrote, “with privacy, intimacy, and charm which are characteristic of the medieval type.” One explanation for the ambiance was that Haight's design matched the Collegiate Gothic exterior of the School of Mines Building (completed in 1874; FIGURE 62). For some, the medieval atmosphere of the space and the alcove layout was “anglophilic,” a prolonged expression of longing that some American felt for British modes of cultural and intellectual authority.⁵⁶ The architecture critic Montgomery Schuyler, for example, described Haight's work for Columbia's Midtown campus in terms of a pronounced “Anglicanism.” Noting that McKim's new neo-classical campus on Morningside Heights was, architecturally, a complete rejection of Columbia's previous institutional image, he acknowledged that “Anglicanism supplied precisely what had for generations been recognized as the most appropriate and attractive architecture for a place of education for English-speaking mankind.”⁵⁷ For others, the medievalism of the Avery may have connoted intellectual detachment; that the library, like a laboratory, was somehow distant from the commercial life of the metropolis and therefore a more appropriate or objective place for the cultivation of professional expertise.⁵⁸

Neither the installation of the Avery collection in Low Library nor the installation in Avery Hall preserved Haight's medieval character, but the alcove layout remained in all three versions. Like “algebra,” the word “alcove” is Arabic in origin, *al-qobbah*, and entered English lexicon from the French *alcôve*. It means “the vaulted chamber.”⁵⁹ In post-monastic libraries, when the growth of secular collections demanded more substantial storage units, one effective means of distributing light evenly around increasingly tall bookcases, especially when clerestory windows were not feasible, was through ambient reflection. A vaulted ceiling satisfied this functional requirement.⁶⁰ By 1890, however, New York City was electrified, municipal leaders having installed Edison's revolutionary technology throughout the city's grid in the 1880s.⁶¹ Hence the pendant fixtures in the central corridor of the first Avery and throughout the second installation in Low Library (FIGURE 63), providing non-flammable, cheap, direct lighting to the readers working underneath them. In the Avery, the alcove form was never functional. It was symbolic and, in the broadest sense, psychological. Like a student's personal studio desk or a thesis project, the layout was meant to inculcate the idea of individuated architectural study within the student. At the École, the only similar spatial dynamic was when

students went “*en loge*” during examinations to prevent them from basing their *esquisse* on reference works or receiving help from their atelier colleagues. For whatever it lacked in quality design instruction, American universities like Columbia were the first to provide whole classes of architecture students with the resources that were necessary for independent study.

One of the more articulate observers of Columbia’s architecture program and the influence of the Avery Library on the program’s curriculum was Percy Stuart, a journalist who visited during the Spring 1900 semester on behalf of the journal *Architectural Record*. Stuart wrote his review as part of a comparative series on American architecture schools. What made Columbia unique to Stuart was its intense individualism, its commitment to “the principle of encouraging, nay requiring the student to rely upon his own judgment, his own taste, his own individuality in the performance of every task that is presented.”⁶² This constituted the kind of liberal education that Ware suggested when he compared the school to a nursery. Using the same metaphor, Stuart wrote, “the cause of higher education thrives best in an atmosphere of latitude and freedom. Particularly is this so of the fine arts, in the practice of which the growth of individuality is the all-important thing, once the right kind of soil has been prepared.”⁶³ He made no mention of history as a potential threat to the cultivation of such individuality. Stuart never imagined that the student might have some innate expressive capacity that historical study or any other kind of pedagogical system might stifle.

Stuart utilized the architectural metaphor of the *sanctum sanctorum*, or the innermost, holiest room in a temple, which was normally guarded and shrouded in mystery, to describe the Avery Library as the symbolic center of Columbia’s curriculum. Students began their early years studying draftsmanship, approaching the history of architecture and ornament slowly, completing exercises in historical drawing in the departmental library in Havemeyer and advanced research next door in the Avery.

If draughtsmanship be the portal, so to speak, to the Temple of Architecture, then the library for historical research may be considered as the inner cella or holy of holies. For what is more precious to the artist than good taste? What is more essential to anyone who professes to a finer kind of living than good taste? And how may this *desideratum* in architecture be acquired save by intimacy with all that is best in her history?⁶⁴

Stuart’s description of the Avery was ecstatic, as place imbued with the holy spirit of the ideal rather than the overwhelming terror of the sublime.

A true lover of art cannot enter this *sanctum sanctorum* without enthusiasm. One experiences a feeling of elation similar to that which Bryant records in his lines from a mountain top: ‘Around the mountain summits thy expanding heart shall feel a sympathy with that loftier world to which thou art translated, and partake the enlargement of this vision.’ The student of architecture upon entering this library may well realize that his hand lies the wealth of centuries, and it will indeed go hard with him if he does not feel richer upon leaving it.⁶⁵

Stuart mentioned other significant places in Columbia's architecture school, including the central corridor of Havemeyer Hall, where student work was exhibited alongside plaster casts for all to inspect. In comparing the library to the *sanctum sanctorum*, however, Stuart's rhetoric carved out a "place of grace" where professional students encountered history religiously, almost as if books could be studied like prayerful incantations. As Levine has pointed out with respect to changes in theater design during this period—once an egalitarian space where all of urban society congregated, after the Astor Place Riot of 1844, theaters separated social classes spatially and through stylistic distinctions between high and popular art—the comparison was also indicative of a process of sacralization, "the Victorian urge to structure or rationalize space," to compensate "for blurred social distinctions by [making] clear spatial ones," widening the distance between the profane world of amateurs and the more sacred mission of professionals.⁶⁶ Like prayer, when one studied in the Avery, Stuart's richly ideological description suggests, it was possible to hear one's vocational calling.

During Stuart's visit to Columbia, he observed a pedagogical exercise that Ware called "design by dictation" that helps to illustrate how students might have interacted with the Avery's bibliographic resources. In this exercise, Ware or another student would read from a written script the conditions and appearance of an architectural monument that they tried to describe as precisely as possible. This stage of the exercise derived from the classical tradition of rhetorical *ekphrasis* in that it demanded that students use architectural terminology to indicate details and more evocative language to gesture toward the qualities of a building's character and context. Ware of a student would then give the description to another member of the class, who graphically translated the description into architectural form. "Students are first given the conditions which govern the construction or treatment of a certain piece of historical work," Stuart wrote, and were "then required to work the problem out in their own way."⁶⁷ Topics covered in "design by dictation" might include "planning, vaulting, treatment of wall surfaces, openings, pilaster capitals and other details."⁶⁸

Pedagogically, there was nothing innovative about this exercise. Nineteenth-century architects were aware of the art of *ekphrasis* at the very least from their reading of Pliny the Younger's letter to Gallus describing his Laurentine villa. Pliny's letter was an important reference point for Scamozzi, Vignola, Palladio, Thomas Jefferson, Andrew Jackson Downing, and the many other enthusiasts of the classical villa in Europe and the United States, including Jules-Frederic Bouchet, who published *Le Laurentin maison de compagne de Pline le consul* in 1852 at the height of the "Pliny craze." Perhaps the most notable devotee of design through *ekphrasis* was the German architect Karl Friedrich Schinkel, who near the end of his illustrious career, having designed a number of country retreats for members of the Prussian royal family in the 1820s and 1830s, completed an imaginary reconstruction project of the Laurentine Villa in 1841. There is also evidence of more immediate connections to Ware. Van Brunt mentions Pliny's villa description in his essay "Architecture in Poetry," which was included in *Greek Lines* (1893).⁶⁹ In 1924, the classical scholar Helen Tanzer even identified two unpublished student Laurentine restitutions from 1864 in the archives of

Columbia's School of Mines—evidence that the exercise had other proponents and preceded Ware's arrival to Columbia in 1881.⁷⁰ Pliny the Younger (61-113 C.E.) was roughly three generations younger than Vitruvius (80-70 B.C.E.-15 C.E.). As du Prey notes, Pliny's description was that of a gifted architectural amateur who was more interested in conveying impressive, sensuous effects than the dry technical information and structural concerns that Vitruvius prioritized in his treatise.⁷¹ Ware's achievement was to identify in this amateurish mode of engaging architecture a legitimate and productive means of professional education. "Design by dictation" rendered the physical presence of the architectural object imaginative; the object existed only as an effect of language. The exercise was, in this regard, especially symptomatic of the general shift in architectural education away from the objective-oriented epistemology of the museum gallery and toward the bibliographic world of the university.

Ware's own explanation of "design by dictation" reiterated many of the principal characteristics that he associated with the liberal study of architecture. First, in assigning students design briefs that were similar to those that their great disciplinary predecessors faced, Ware believed that it made the achievements of these predecessors easier to appreciate, and thus more instructive. "It is plain that the special excellencies of the original monument," Ware wrote, "are likely to reveal themselves with fresh distinction and to find special sympathy and appreciation in the mind of one who has striven, however unsuccessfully, to solve the same problem."⁷² In this explanation, like Stuart's ecstatic description of the Avery, it was the imaginative capacity for sympathy that the promising architecture possessed, or an ability to understand or think alongside one's disciplinary predecessors. In later years, with the growing influence of German psychology on architectural theory, an empathetic appreciation for architectural form, which did not require scholarship, would replace the historicist emphasis on sympathy.⁷³ Around the turn of the century, though, architectural education was using turning inwards in order to make students, Ware believed, all the more prepared to step into the helter-skelter landscape of modern life.

Ware found that Columbia architecture students were, in fact, quite good at completing the circuit between description, interpretation, and restitution. When Ware asked students to write their own descriptions instead of using his own he found that the interpreters were similarly successful. "It constantly happens," Ware delightfully claimed, "when both description and interpretation are careful and scholarly, that the result looks like a copy of the photograph or drawing from which the dictation was made. It is surprising and instructive indeed to see how much of the spirit and charm of an original may be preserved in spite of considerable changes of proportion and detail."⁷⁴ Second, Ware thought that structuring the design process through literary acts of description and interpretation promoted the growth of what he called "the representative imagination" or the "eye of the mind," which earlier in his career (see Chapter Two), he referenced in regards to the usefulness of drawing instruction.

In order to judge from the drawings of a building, whether plans or elevations, what its real appearance will be, how, on the outside, the masses will compose against the sky, or what impression, inside, will be made in passing from one

story to another, from corridor to corridor, or from room to room, one must perceive something that no drawing can show, and which can be seen only by a serious effort of the representative imagination, the imagination which has been well defined as the 'capacity for seeing in anything all the excellencies that the thing itself suggests.'⁷⁵

Third, Ware believed that design by dictation fostered individuality. Historic precedent did not represent an oppressive authority, to which students must submit. Rather, in strengthening the imagination, historical study refined the student's creative judgment within a tradition.

It is better for a student to find things out for himself than to be told them. It makes him answer the question, the most searching of questions, 'How would *you* do it?' The artist, whose function is a creative one—whose business it is to do original work, yet who must be well versed in all the experience of his kind, profits greatly if he can gain this erudition through the exercise of his active and inventive powers instead of assuming, during the long time necessary for its acquisition, a passive and merely receptive attitude. The architect, especially, is what the Greeks call the poet, and what the Scots call him too, a maker.⁷⁶

In 1912, after Ware had retired to Milton, Massachusetts and three years before his death, Avery Hall, the third and most monumental home of the Avery Library, opened. Samuel Putnam Avery Jr., Henry's older brother, made the donation for "a separate building for the exclusive use of the Avery Library" (FIGURES 64-65)—the tenancy of the actual School of Architecture in the three floors and attic about the library was but an afterthought.⁷⁷ William M. Kendall of McKim, Mead, & White designed the Harvard brick and limestone-trimmed building, which occupied one of the four interior building plots reserved in the campus's master plan. A.D.F. Hamlin, Ware's protégé who became the interim head of the department from 1903 until 1912—a transition period for the school between Ware's historicist legacy and the formalist inclinations of more influential American Beaux-Arts architects like McKim—described the grandeur of the new space (Figure 66). It was "a splendid hall, 146 x 46 feet, comprising rows of alcoves on either side separated by square piers of Istrian marble, with striking capitals, inspired by those of the inner piers of the Temple of Apollo at Miletus."⁷⁸ The upper stories of the building contained a seminar room for Greek archeology, an enlarged department library, faculty offices, four lecture rooms, freehand drawing and drafting rooms, and a storage attic filled with building materials and appliances that belonged to the School. Hamlin also mentioned that "throughout the entire building the fine collection of casts which the School has gradually accumulated in its thirty years of existence has been, or is being, arranged in such manner"—and this is the revealing qualification—"as to produce admirable decorative effects."⁷⁹ First- and second-year students might sketch from this residual collection of casts, but it no longer held the same priority that the collection Ware used in Havemeyer or, indeed, the Rogers Building at M.I.T. once did.

Had Avery Jr. made his gift to Columbia only a decade earlier, it might very well have been the case that the design of Avery Hall would have centered around a large hall of

casts rather than a library. The construction of Robinson Hall at Harvard, also designed by McKim, Mead, and White, provides a revealing point of comparison. In 1899, Nelson Robinson Jr., an undergraduate at Harvard and the only son of a railroad tycoon from Buffalo, fell off of a campus building and died. To memorialize his son, as well as the eldest son of Harvard's president, the landscape architect Charles Eliot Jr., who had died from spinal meningitis in 1897, Robinson Sr. made a donation to Harvard to construct a new building for the architecture and landscape architecture schools near the center of Harvard Yard, in addition to endowed professorships and travelling fellowships for the schools. Robinson Hall opened in 1902. H. Langford Warren, the head of Harvard's architecture school, based the program for the new building on a visit to Havemeyer Hall at Columbia. In his study of the history of architectural education at Harvard, Anthony Alofsin suggests that the *objet d'art* in the architectural museum that Ware installed in the attic of Havemeyer made a strong impression on Warren.

To equip the building, Warren specified drafting rooms with large windows, a library with tables and cases for photographs, a free-hand drawing room, a room for samples of building materials and small structural models, and two instructors' rooms. Pride of place went to the Great Hall, a space intended for the exhibition of original antique fragments and casts. Filled with artifacts and models of the monuments in the history of architecture, the Great Hall represented classical beauty, proportion, and form, and its proximity to the students of both architecture and landscape architecture was essential to their training. Warren maintained that simply being around these cultural artifacts elevated students' aesthetic sensitivity.⁸⁰

The layout of Robinson Hall around the Great Hall (FIGURES 67-68) demonstrates that Warren and McKim still conceived of the architecture school as a museum in which students would learn through osmosis, unaware of the educational changes taking place beneath their feet. Though Warren was a historicist pedagogue like Ware, the building reflected McKim's classicist orientation. A decade later, when Avery Hall opened on the Columbia campus, "pride of place" belonged to the library.

Avery Hall reoriented the axes of daily student life at Columbia's architecture school. Previously, as Stuart observed, the exhibition-jury space in the corridor of the top floor of Havemeyer Hall was the program's central avenue (FIGURE 69). The department library, the drafting rooms, and the lecture halls fell on either side of the corridor, which served as a gallery for a constant rotation of student work "clothespinned to the racks and subjected to criticism of every passerby."⁸¹ Avery Hall, in contrast, vertically integrated alcove spaces for individuated study with the social spaces devoted to the practice of design. These two typologies, the library and the studio, defined as they were by very different pedagogical values, formulated hitherto an architectural problem because they both competed for natural light. The design for large public libraries and university libraries like the one McKim produced in 1895 in Boston normally elevated the main reading room to a second story, where large, arched windows allowed for the illumination of the interior during daytime, a scheme Labrouste had first developed at the Sainte-Geneviève Library in Paris, completed in 1850. Similarly, John Galen

Howard utilized this solution in his 1904 design for Doe Library at the University of California, Berkeley. In Avery Hall, however, the upper-two stories of the building, which received good natural light, were reserved for graphic work, the one activity that distinguished the discipline of architecture from every other department on Columbia's campus.

Still, for Hamlin, the "infinite resources of suggestion and inspiration" contained in the Avery Library's new home still found a way to "bubble up" to the students working in the design studios above it. In the scheme for the Boston Public Library, McKim, Mead, & White and their clients had experimented with the use of pneumatic tubes and book railcars to convey requests and materials from the subterranean stack floor to the reading room above it, the first time these technologies had been utilized in a non-commercial setting. Carrere and Hastings then continued the experiment at the New York Public Library by installing a mechanical book lift, which had recently been patented and developed for other large public libraries, as a "labor saving device" to move material between three zones: a basement loading dock, the underground library stacks, and the main reading room. Twenty years after the Boston Public Library opened, Kendall, who was a member of the design team for that project, placed two electrical lifts, likely manufactured by the Otis Elevator Company, within the eastern shafts of Avery Hall (FIGURES 70-71). According to Hamlin, these electrically-powered lifts "established a new link between the School of Architecture and the Library of the University." They were

The key to the entire scheme of the building and the relations between its two tenants. By these lifts the entire resources of the Avery Library are made directly available for the School of Architecture, both for use by the students and for classroom illustration as well as for study by the officers of instruction. The physical separation between the School and the Library has been exchanged for the physical connection whose value can only be fully measured by the test of experience as the years furnish this.⁸²

Hamlin had been appealing to Columbia's trustees for this kind "ready reference" equipment since 1904, when he submitted a report that lobbied university administrative for improved facilities. In the report, he melodramatically recounted the physical effort involved in using the Avery.

The magnificent Avery Library is available only for reference work in the Library building itself. To reach it, a student from this School must descend one hundred steps and climb about forty and returning descend forty, and climb one hundred. Of course, this prohibits that constant and instant reference which is essential in the drafting room. The splendid provision of that Library ought to be supplemented by a large addition to the books of our own shelves, which officers can take to their rooms and the students to their desks, or which can be consulted in the Departmental Library, with the expenditure of but a few steps, or half a minute's time going and coming.⁸³

By 1912, when Avery Hall was constructed, Taylorist studies in “educational organization,” a subfield of industrial organization, like Morris L. Cooke’s *Academic and Industrial Efficiency* (published in 1910 and based on data collected, in part, at Columbia), were available to justify Hamlin’s request to make book retrieval less laborious.⁸⁴ University administrators had begun to tabulate the value of the campus’s physical capital, the frequency with which students used various parts of it, and the cost of maintaining these parts. Spaces like the Avery Library, once symbols of prestige, now had to prove their usefulness for producing research and competent graduates, and physical proximity made the usefulness of this particular collection more likely. More importantly, however, the need that Hamlin articulated for “constant and instant reference” indicated a heightened architectural need for data. Once a temple of history, by the time the library moved to Avery Hall, it was already becoming an information center, only a device, Hamlin later wrote in an essay on library architecture, “for bringing books and readers together.”⁸⁵

Resisting the Collegiate System: The Bibliophobic Tradition in American Architecture

Any discussion of the growth of collegiate system of architectural education or architecture libraries like the Avery would be incomplete without acknowledging resistance to this growth. Words, books, libraries: perhaps surprisingly, these were controversial topics in British and American architectural culture around the turn of the century and led some outspoken critics of the profession’s pact with the university to invoke the old classical distinction between words and things, *verba et res*, as a way to protect the discipline from discursive capture. Reginald Blomfield spoke for many of the more conservative architectural pedagogues in Britain, most of whom were products of pupillage, when he insisted that “the reading of books will not make an architect; his proper study must always be buildings.”⁸⁶ A founder of the Art Workers Guild, an organization devoted to the design ideals of William Morris and the Arts and Crafts Movement, Blomfield opposed professionalization and the institutionalization of architecture within the university setting. His bibliophobia—my shorthand term for the belief that words, books, and libraries were a disciplinary evil rather than a disciplinary good—was symptomatic of an antimodernist nostalgia that was widespread among British cultural elites.⁸⁷ For those who cherished the craftsman ideal and defended apprenticeship against deskilling as an inevitable effect of capitalism, architecture was best understood as an object of human labor. The static images and dead letters that comprised any mass-produced architecture book, even if they made architectural education more accessible, only furthered the alienation of head from hand that many Arts and Crafts reformers feared. This sentiment is most clearly expressed in the hallmark 1892 publication *Architecture: Art or Profession?*, wherein a group of British architectural educators known as the “Memorialists,” including Norman Shaw, T.G. Jackson, and W.R. Lethaby, insisted to Parliament and the readers of the *London Times* that architecture could not be examined by official registration boards because it was not ultimately codifiable in print. In rejecting an architecture “on the books,” or professionalism, the Memorialists tried to prevent architectural education’s entrance into

the ostensibly meritocratic world of academia, premised on the ideals of transparency and testing, and sought to recreate the artisanal ideal of the medieval lodge.⁸⁸

While bibliophobia in British architectural culture was associated with craft, in American architectural culture it was part of a naturalist tradition and drew upon the values of Emersonian Transcendentalism, Walter Smith's art crusade, Calvin M. Woodward's manual training movement, and John Dewey's push for progressive educational reform. As Chapter Two indicated, in the period between 1880 and 1920, as the educational sector expanded to include new kinds of practical subjects and as the category of experience grew in pedagogical influence, a rhetoric that was critical of language's monopoly on learning found new purchase. For example, in *The School and Society* (1899) Dewey wrote that the tendency to approach nature through the medium of literature...fails to note that there is a more straightforward road from mind to the object—direct through connection with life itself.⁸⁹ In 1907, President Theodore Roosevelt, always passionate advocate of the strenuous life, told Congress, "Our school system is gravely ineffective insofar as it puts a premium upon mere literacy training" and that the country needed skilled workers with "industrial intelligence" (then a neologism) in order to compete economically with manufacturing powerhouses like Germany.⁹⁰ In 1911, G. Stanley Hall admitted in his book *Educational Problems* that "We [Americans] are prone to put too high a value both upon the ability required to attain this art [literacy] and the discipline involved in doing so."⁹¹ Public figures like Dewey, Roosevelt, and Hall were far removed from the immediate concerns of the architectural world, but in furthering the cause of vocational reform, which in the 1870s had elevated the disciplinary status of architecture, they inadvertently reinforced a skepticism toward reading.

Two of the most outspoken bibliophobes in turn-of-the-century American architecture were Louis Sullivan and Frank Lloyd Wright. Their skepticism toward reading and celebration of nature-study as an educational alternative helps to underscore the significance of collections like the Avery Library as a critical intervention into the history of architectural education. Bibliophobia was a tactic that Sullivan and Wright used to resist both the normative constraints of architectural professionalism in their own country and the influence of the European canon; it was a way to cast themselves into the roles of outsider, liberator, and savior whenever it was to their advantage. While previous scholars have explained Sullivan and Wright's valorization of experience in regards to their engagement with Transcendentalism or in terms of the transition from historicism to functionalism, it is also possible to read them strictly as anti-institutionalists who tried to resist the schooling of architectural education.⁹²

In Sullivan's sociological imagination, one could equate the social power of the architect to the number of books he possessed. Sullivan vividly described this relation in his *Autobiography of an Idea* (1922), a text completed near the end of a slow, twenty-year decline in his career. While walking along Boston's Commonwealth Avenue sometime in the 1870s, a street modelled on the grand boulevards of Haussmann's Paris, Sullivan, the son of Irish and Swiss immigrant parents, recounts seeing "a large man of dignified bearing, with beard, top hat, [and] frock coat, come out of a nearby building, enter his

carriage and signal the coachman to drive.” When young Sullivan asks a nearby workman about the dignified figure in the carriage, the workman, a foreman on a nearby construction site, explains to him that the man is an “archeetec” and that “archeetecs” draw plans for buildings, come up with designs “out of [their] heads,” and, most importantly, are “the boss of everybody.” Impressed, Sullivan then asks the foreman how someone becomes an “archeetec,” a question to which the foreman replies, “You got to have an education. Of course us mechanics has our books too. That’s the way we lay out stairs, rails and things like that. But you got have *more* brains, *more* experience, *more* education and *more* books, *especially* more books, to be an archeetec.”⁹³ Through this episode, a primal scene for Sullivan in that it was supposedly his first encounter with a living professional architect, and through the folksy usage of satirical misspelling, Sullivan suggested to his readers that the social distinction between an architect and a builder had little to do with better taste, a historical sensibility, or ethical behavior. The possession of more books symbolized more time in school, and more time in school amounted to increased social status. Sullivan was, of course, a writer, and he used his literary persona to fashion himself differently than the professional image. But, ironically, he never distinguished between the possession of books and the educational potential of actually reading books. Never entranced by the glow of erudition that books supposedly emitted, Sullivan perceived that there was some relation between book collecting as tokens of learning and what would now be known as credentialism. “Architecture is the name of a system of accredited, historical facts as useful, as available and as susceptible to inspection as the books of a mercantile house,” he once wrote, disgusted by the commercial logic behind historical decoration.⁹⁴ Books for Sullivan were merely a source of income; they provided no special purchase on artistic truth.

Sullivan’s bibliophobia was an expression of social critique, but the duplicity of written language was also a persistent philosophical theme in Sullivan’s writing, both in his *Autobiography* and in his earlier essays. In the *Autobiography*, Sullivan could hardly contain his epistemological distrust of verbal mediation, even as he partook in it as a writer. “How monstrous, how fluent, how vagrant and timorous, how alert are the living things we call words”; then, “Words are the most malignant, the most treacherous possession of mankind”; and finally, “...it is wise to handle words with caution. Their content is so complex and explosive; and in combinations they may work beautiful or dreadful things.”⁹⁵ Sullivan rejected language because he thought that it was possible, and preferable, to think outside of it. In a description of himself as a child, he wrote:

He preferred to think and feel and contemplate without the use of words. Indeed, one of his favorite pastimes was deliberately to think and feel and contemplate without the use of words, to create thus a wordless universe, with himself, silent, at the center of it all. Thus came about a widening clarity; an increased sensitiveness to values; a separate isolation of the permanent and the ephemeral; and it seemed, also, as though within his small, self-created silence he listened to the strident noises of the world as coming from without.⁹⁶

The passage repeats the Emersonian fantasy, described in the “Nature” essay of 1834, in which the philosopher becomes a “transparent eyeball” walking across a pre-linguistic landscape, able to discern the essential particularities of nature in all of their immediacy (FIGURE 72).⁹⁷ As Twombly has explained, Sullivan did not believe in the idea that one could structure rational thought with the cognitive scaffolding of historic precedent, a position that contributed to his antipathy to historicist forms of architectural education. “Words [for Sullivan] were *symbols* of ideas based on instinct not the ideas themselves... Sullivan believed that creativity began with the emotions, that it was primarily spiritual and instinctive. Only later, after an insight ‘came’ to the receptive agent, could intellect and reason fashion it into a work of art.”⁹⁸ Like a photographic camera, Sullivan’s poetic aspiration was to register the sensory qualities of the world around him and then to respond to them purely in architectural form. This modernist impulse to abstraction—to withdraw from and thereby reject historic or social norms, epitomized by the institution of language—was, as Daston and Galison have shown, part of the rhetoric of mechanical objectivity. If the role of the architect, like the scientist or realist author, was “to let nature speak for itself,” then there was no need for the university’s expensive libraries and the pedagogical exercises aimed at cultivating individual judgment. In fact, judgment from this perspective was worse than unnecessary; it was positively distorting. Like a Primitivist, Sullivan believed that real expertise derived from immediate access to the sensuality of nature, a deliberate regression from the fine arts tradition.⁹⁹ Never mind that Ware, too, was trying to formulate in his liberal course an alternative to the Beaux-Arts system.

Although it is possible to read Sullivan’s rejection of language more narrowly as a response to the prominence of the Beaux-Arts pedagogy in the 1910s and 1920s in American architecture schools, it is clear that Sullivan began to stake out this position as far back as the 1880s, when Ware was just getting Columbia’s architecture program off the ground. In an essay entitled “Style,” Sullivan described the creative process as an organismic response to environmental conditions as opposed to something that one could consciously learn.¹⁰⁰ In “The Artistic Use of the Imagination,” like the above passage from his *Autobiography*, Sullivan claimed that imagination came from emotion and instinct, not the workings of reason, and that all education was, in essence, sensorial. “To know one must touch—from every touch there comes a sensation, and it is this sensation that we call an experience.”¹⁰¹ In “Emotional Architecture as Compared with Intellectual: A Study in Subjective and Objective,” Sullivan continued this line of affective thought in defining architecture haptically: “Meaning not the touch of the painter, not the touch of the sculptor, not the mechanical and technical touch of the fingers only, not quite their negligent contact with things, but the exquisite touch of the sensibilities, the warm physical touch of the body, the touch of a sound head and a responsive heart, the touch of the native one, the poet, out of doors, in spontaneous communion with Nature.”¹⁰² Near the end of “The Young Man in Architecture,” an address that Sullivan read at the annual convention of the Architectural League of America in 1900, he reminded his audience

You will have observed doubtless, that, thus far, while endeavoring to lead you toward a sane and wholesome conception of the basis of the architectural art, I

have said not a word about books, photographs, plates. I have done this advisedly, for I am convinced beyond a shadow of a body that never can you acquire from books, or the like, alone, even a remote conception of what constitutes the real, the living, architectural art. It has been tried for generations upon generations with one unvarying result: dreary, miserable failure...should I begin by putting into your hands a book or its equivalent, I would according to my philosophy be guilty of an intellectual crime.¹⁰³

Suffice to say that Sullivan was not a creature of the architecture library. His aspersions against books and reading were meant to inspire listeners to pursue self-knowledge confidently and to approach the new problems of the modern architectural world without preconceptions. Unfortunately, Sullivan's writing could also come perilously close to the most vulgar kind of anti-intellectualism. Though it might inspire the young, his was not a philosophy that could sustain a more mature architectural career.

For Sullivan, the modern building type that most undermined a collegiate system of architectural education based on historicism was the skyscraper. In his most famous essay, "The Tall Office-Building Artistically Considered," Sullivan asserted that the conception of any radically new form of building such as the tall office-building was only possible "if we follow our natural instincts without thought of books, rules, precedents, or any such educational impedimenta to a spontaneous and 'sensible' result."¹⁰⁴ The "bookworms" and "cowards" had failed to solve the problem posed by the skyscraper.

The tall office building should not, must not, be made a field for the display of architectural knowledge in the encyclopedic sense; that too much learning in this instance is fully as dangerous, as obnoxious, as too little learning; that miscellany is abhorrent to their sense; that the sixteen-story building must not consist of sixteen separate, distinct, and unrelated buildings piled one upon the other until the top of the pile is reached.

To this latter folly, I would not refer were it not the fact that nine out of ten tall office buildings are designed in precisely this way in effect, not by the ignorant, but by the educated. It would seem, indeed, as though the 'trained' architect, when facing this problem, were beset at every story, or, at most, every third or fourth story, by the hysterical dread lest he be in 'bad form;' lest he be not bedecking his building with sufficiency of quotation from this, that, or the other 'correct' building in some other land and some other time; lest he be not copious enough in the display of his wares; lest he betray, in short, a lack of resources. To loosen up the touch of this cramped and fidgety hand, to allow the nerves to calm, the brain to cool, to reflect equably, to reason naturally, seems beyond him; he lives, as it were, in a waking nightmare filled with the *disjecta membra* of architecture. The spectacle is not inspiring.¹⁰⁵

Sullivan believed that in encouraging his followers to scrape historical ornament off of architectural form, he was helping to clear a *tabula rasa* on top of which modern problems like the skyscraper one could more logically assess. It was the vanity of trained architects and their concern to save face that from his perspective led them into

vacuous formal demonstrations of their fine judgment rather than a more honest assessment of the conditions and programmatic requirements of tall buildings.

After Sullivan, the next greatest member of the bibliophobic tradition was Frank Lloyd Wright. In Wright's *An Autobiography* (1932), he viciously disparaged the university and the practice of reading in order to fashion himself as a visionary. Rather than a subject of an educational system, he was a born architect—he claimed that his mother had a premonition during pregnancy that her child was destined to become a greater designer. “A listening ear, seeing eye, and sensitive touch had been naturally given to him,” Wright wrote of himself as an eleven-year-old in 1872, riffing on Sullivan's adaptation of the Emersonian theme. “His spirit was now becoming familiar with this marvelous book-of-books, Nature-Experience, the only true reading. The book of Creation.”¹⁰⁶ Wright gave the impression throughout this text that creative inspiration came to him only after he turned to “inner *experience* for what he heard, touched or saw.”¹⁰⁷ He mentioned that he had read bits of Ruskin, Morris, and Viollet-le-Duc, but not studiously. Rather than books, it was, of course, young Wright's encounter with Froebel blocks, which his mother must have discovered prior to their display at the German exhibition of the Philadelphia Centennial Exposition of 1876, that drew out his inborn genius. That exposition also included displays of the Russian Della-Vos method of manual instruction and the Sloyd system of woodworking from Scandinavia, two pedagogical innovations that helped to propel the vocationalist movement. From *An Autobiography*, however, it is clear that Wright had little understanding of the educational context of his own upbringing, or how vocationalism was already helping to expand and reform the institutions of higher learning that he resented. It could not have been a coincidence that the same year that Wright published his *Autobiography* he also opened Taliesin, his work-study program in Wisconsin as an alternative to the collegiate architecture school. In addition to being an instrument of self-publicity, *An Autobiography* served as an educational manifesto, but it was a manifesto directed against a system that would only absorb his criticism and grow stronger.

Wright's animosity to any course of study that smacked of liberal humanism is most explicit in his comments regarding a year spent as a special student at the University of Wisconsin in Madison, which he attended in 1887 before dropping out and moving to Chicago to become a draftsman. During his first year, Wright interned as an office boy for a civil engineering professor named Allan D. Conover. Wright picked up the rudiments of technical drawing from this job and described the experience as “truly educational.” With respect to the rest of his time on campus, however, he wrote that “he was waiting for something to happen that never could happen. Now he realized that it never could for ‘they’ were all there to see that it did not and should not happen. Reading Goethe only made matters worse, for action, again action and more action was his urge.”¹⁰⁸ Complicating Ware's account of architectural education in the 1880s and 1890s is the fact that it was written three decades later, when his work, for many years ignored by the American architectural community, was celebrated by European architects for its modernist tendencies. Wright, then, viewed the liberal study of architecture through a modernist lens, making no attempt to distinguish the educational ambitions of Ware's historicist generation from the traditions of the *École des Beaux*

Arts. The term “culture,” for example, which meant so much to architect-historians like Ware, meant little to Wright. In his *Autobiography*, he wrote “The boy already wondered why ‘Culture’—what the University stood for wasn’t it?—shouldn’t consist in getting rid of the inappropriate in everything. Whereas ‘Education,’ as he encountered it, was as inappropriate as the rubbish wheeled by the contractor into the foundation piers of the Capitol. This he couldn’t have told you then, but he felt it somehow—as waste—resenting it.”¹⁰⁹ Culture, for Wright, was ornamental; it had nothing to do with the historical sensibility of Ware’s professionalism.

Stepping back to consider the development of architectural thought and education over the course of the long nineteenth century, one recognizes that both the architectural bibliophobia of early American modernists like Sullivan and Wright and the development of spaces like the Avery Library, were responses to the problem of choice and the identity of the architect-as-selector that emerged with the onset of eclecticism. For bibliophobes, the vitalist-organicist notion that one simply reacted to the environment instinctively helped them to distance themselves from the problem of choice through an analogical sleight of hand: if nature or natural instinct made stylistic selections on its own, as evolutionary theory seemed to suggest, then the use of a library as a tool to cultivate professional judgment was unnecessary.¹¹⁰ Sullivan and Wright simply bypassed the need to structure aesthetic response through some sort of disciplinary tradition.¹¹¹ In contrast, for a liberal pedagogue like Ware, the inevitability of human choice in architectural practice was what provided him with an institutional mandate. Architecture was only metaphorically like an evolving nature, and the modern architect was, after all, a selector whose intuition could be improved through study. Given this situation, the purpose of an architectural education was to help students learn to make the right choices, and this need for informed judgment justified the financial and organizational investment in an entire bibliographic infrastructure like Avery Hall.

Conclusion: The Bureaucratization of Architectural Authority

Objects and books: these were two major sources of authority in nineteenth-century American architecture. When art museums stopped collecting plaster casts, the importance of university library collections to architectural education increased in proportion. Of course, it was not as if the architectural object disappeared and was replaced by library collections—although in some cases they quite literally did; plaster casts simply receded in importance. Once subject to intense scrutiny, they became over the course of the twentieth centuries interesting decoration, often displayed within libraries and in hallways, but rarely studied intently. And while there were those who bemoaned the new order of books from their positions outside the collegiate system of architectural education, no serious institutional alternatives to the university developed in subsequent years. Historicism prepared the way for modernism to make its home the in hostile territory of the university and the discipline has remained there ever since, despite whatever discomfort or feelings of marginality that educators may have experienced.

To some extent, the history of the Avery Library was determined by exceptional local conditions, such as the wealth and philanthropy of Gilded Age New York and the history of the Metropolitan Museum of Art. But once established, it became enormously influential across the country. Other early programs like the architecture school at the University of Pennsylvania, which originally emphasized the fine arts, and the architecture school at the University of Illinois, which was known for its strength in engineering and architectural science, also built up their libraries in the period between 1890 and 1920, even though their faculty were less devoted to historicism than Ware and Hamlin. Stuart, for instance, noted the influence of Ware's curriculum at University of Pennsylvania. "This grafting of Columbia as well as other stock, so to speak, upon Pennsylvania's architectural tree of knowledge," he wrote,

has naturally had noticeable effect upon the fruits thereof. The influence which that wise head of the former school [i.e. Ware] exerts upon architectural education extends far beyond the walls of his own great institution. Which is at it should be. Our Architectural Schools are like the students in a course of architectural design. Each one is working independently and along its own lines, but all are in active sympathy with each other, for all are striving for essentially the same goal. The good things are passed around as far as they will go, and each one digests them in his own way.¹¹²

It perhaps goes without saying that a book is not a master. Though the author of a book might be able to provide a student with information and possibly even inspiration, a reader does not learn from a book in the same way that an apprentice learns from a master. The mediated relationship, for better or worse, is impersonal. When architecture entered the modern research university, it entered a powerful bureaucracy, a world of documents and references. In this academic bureaucracy, architectural authority took one step farther away from the gentlemanly amateurism and one step closer to technical expertise. The liberal study of architecture was in this regard a midpoint in a trajectory that continued into the middle of the twentieth century.

For the sake of chronology, one might reasonably argue that the late 1880s was the period when the essential nature of architectural education, as the organized transmission of knowledge and authority, changed. Henry Hobson Richardson, the most famous nineteenth-century American architect, died in 1886 and his office-school in Brookline, Massachusetts (FIGURE 73) closed. The American architectural critic Mariana Griswold Van Rensselaer, in a chapter entitled "Methods of Teaching" near the end of her book-length hagiography of Richardson (published in 1888), described Richardson's pedagogy as essentially *unmethodical*. "Such methods of vicarious yet personal creation and of vague yet pregnant and, in the end, very definite instruction cannot be explained in words," Van Rensselaer wrote. "They were not so much methods of teaching in the usual sense of the term as of inspiration and, so to say, magnetic transmission, and as such are beyond the power of logical thought to analyze or of language fully to record."¹¹³ Without using the term, Van Rensselaer characterized Richardson's pedagogy, like his personality, as charismatic; he transmitted his

knowledge to the men who worked and lived with him through the sheer force of his imposing creative presence, a presence which Hubert Von Horkomer's 1886 portrait captures so effectively (FIGURE 74). For Van Rensselaer, Richardson was the architect as a great artist, the last master-builder, and a teacher-sage who could not be confined to the institutional parameters of university life. She celebrated him for keeping a Romantic ideal of craftsmanship and fraternal order alive, even while she recognized that the personal magnetism that governed his atelier might seem "alien" given the "mental attitude and the professional customs of our time."¹¹⁴

Richardson's atelier was a vestigial pedagogical environment that was out of sync with the structure of professional instruction. Whereas an institutional device like the Avery Library provided an ideal spatial order, Van Rensselaer suspected that what unified the transmission of architectural expertise in this setting was only the body and spirit of the master.

Most architects, we are aware, either design a building themselves or hand it over to a subordinate and leave him to deal with it pretty much as he thinks fit; we often see the fact all too clearly expressed in the various structures credited to a single office. Except in his very early years Richardson never, in the literal sense, designed a building himself. Yet each building that bears his name was from end to end really his creation. He developed the individual powers of his pupils, yet moulded them for the time at least into a visible likeness with himself; and he impressed upon them for all time his broad beliefs with regard to the essential virtues which a work of architecture should possess.¹¹⁵

In this passage, Van Rensselaer tried to persuade her readers that the ultimate purpose behind Richardson's "Methods of Teaching" was to resist the division and specialization of architectural labor. Although Richardson did not personally design every facet of his buildings, because he designed all of the employees who designed every facet of his buildings, he left his mark—his authorial signature—on each project indirectly.

At Columbia, there was no master and the onus of cultivating one's judgment belonged to the individual student. Architectural education "must be carried on not by exceptional men occupying conspicuous positions in the ranks of the profession," Ware once wrote, "but by ordinary persons like ourselves, fairly intelligent and well-informed, but who, however devoted and faithful are nothing out of the common."¹¹⁶ The self-acknowledged ordinariness of the faculty might even be an asset insofar as it forced students to develop their own personalities. "An overpowering personal influence is likely to do as much harm as good," Ware maintained. "The most famous masters have seldom turned out famous pupils. They stimulate imitation, not originality."¹¹⁷ Columbia's magnificent resources for the study of architectural history compensated for whatever the school's studios lacked in exceptional personality. Learning to study in the Avery prepared students for the inevitable periods of doubt or confusion and prevented them from turning to a master for a ready-made solution. "If they are at any time at a loss for a suggestion," Ware wrote of his students, "they turn as familiarly to Bramante or Peruzzi

as to ourselves, and these masters become enlisted, as it were, upon our personal staff.”¹¹⁸

The bibliographic apparatus described in this chapter was an alternative to the charismatic model of education in the atelier, one that served a larger student body and could work with a less magnetic faculty. Indeed, one might even go so far as to say that the institutional order of architectural authority based on the study of books suppressed the disruptive threat of the charismatic designer, although as the academic careers of Walter Gropius, Louis Kahn, and countless other inspirational design personalities in the American university attest, this suppression was never complete. Indeed, as Weber understood, rationalization and re-enchantment are complementary, not contradictory, social processes.¹¹⁹ With the arrival of modernism, the order of the studio would, once again, replace the order of books.

Endnotes to Chapter Three

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- ¹ Bruce A. Kimball, *The "True Professional Ideal" in America: A History* (Rowman & Littlefield Publishers, 1996).
- ² W., "Henry Ogden Avery," *American Architect and Building News* 28, no. 750 (May 10, 1890): 91.
- ³ On Samuel Putnam Avery's career, see Ted Goodman and Angela Giral, "Samuel Putnam Avery and the Founding of Avery Library, Columbia University," *Art Documentation: Journal of the Art Libraries Society of North America* 16, no. 2 (1997): 6–8.
- ⁴ Details about the Samuel Putnam Avery's gift can be found in newspaper clippings including in the H.O. Avery archive. See "Henry Ogden Avery Architectural Drawings and Papers, 1872-1890," n.d., D&A H.O. Avery, Avery Archives, Columbia University.
- ⁵ Frederic Cople Jaher, "Nineteenth-Century Elites in Boston and New York," *Journal of Social History* 6, no. 1 (1972): 32–77.
- ⁶ Steven Conn, *Museums and American Intellectual Life, 1876-1926* (Chicago: The University of Chicago Press, 1998).
- ⁷ Isabelle Flour, "'On the Formation of a National Museum of Architecture': The Architectural Museum versus the South Kensington Museum," *Architectural History* 51 (2008): 211–38.
- ⁸ James Fergusson, *On a National Collection of Architectural Art*, Introductory Addresses on the Science and Art Department and the South Kensington Museum (London: Chapman and Hall, 193, Piccadilly, 1857).
- ⁹ Tom Flynn, Tim Barringer, and Tim Barringer, "The South Kensington Museum and the Colonial Project," in *Colonialism and the Object: Empire, Material Culture and the Museum*, 1 edition (London ; New York: Routledge, 1998), 19.
- ¹⁰ Malcolm Baker, "The Reproductive Continuum: Plaster Casts, Paper Mosaics and Photographs as Complementary Modes of Reproduction in the Nineteenth-Century Museum," in *Plaster Casts: Making, Collecting, and Displaying from Classical Antiquity to the Present*, ed. Rune Frederiksen and Eckart Marchand, Transformationen Der Antike, Bd. 18 (Berlin ; New York: De Gruyter, 2010), 485–500.
- ¹¹ Flour, "'On the Formation of a National Museum of Architecture,'" 227.
- ¹² David van Zanten, "Félix Duban and the Buildings of the Ecole Des Beaux-Arts, 1832-1840," *Journal of the Society of Architectural Historians* 37, no. 3 (1978): 161–74.
- ¹³ On Viollet-le-Duc and the formation of the plaster cast collection at the Trocadero, as well as the general history of architectural plaster cast collecting, see Mari Lending, *Plaster Monuments: Architecture and the Power of Reproduction* (Princeton: Princeton University Press, 2017), 70–105; Mari Lending, "Promenade Among Words and Things: The Gallery as Catalogue, the Catalogue as Gallery," *Architectural Histories* 3, no. 1 (December 24, 2015), <https://doi.org/10.5334/ah.da>. This quotation comes from Lending, *Plaster Monuments*, 5.
- ¹⁴ Stephen L. Dyson describes university cast collections in his "Cast Collecting in the United States," in *Plaster Casts: Making, Collecting, and Displaying from Classical Antiquity to the Present*, ed. Rune Frederiksen and Eckart Marchand, Transformationen Der Antike, Bd. 18 (Berlin ; New York: De Gruyter, 2010), 557–76.
- ¹⁵ Pamela Born, "The Canon Is Cast: Plaster Casts in American Museum and University Collections," *Art Documentation: Journal of the Art Libraries Society of North America* 21, no. 2 (2002): 8.
- ¹⁶ Alan Wallach, "The American Cast Museum: An Episode in the History of the Institutional Definition of Art," in *Exhibiting Contradiction: Essays on the Art Museum in the United States* (Amherst, Mass: University of Massachusetts Press, 1998), 38–56.
- ¹⁷ Pauline A. Saliga, "Plaster Casts, Period Rooms, and Architectural Fragments: A Century of Representing Architecture at the Art Institute of Chicago," in *Fragments of Chicago's Past: The Collection of Architectural Fragments at the Art Institute of Chicago*, ed. Pauline A. Saliga (Chicago, IL: Art Institute of Chicago, 1990), 52–67. For a primary source description of the Art Institute's cast collection, see Alfred Emerson, *Illustrated Catalogue of the Antiquities and Casts of Ancient Sculpture in the Elbridge G. Hall and Other Collections, Part I. Oriental and Early Greek Art* (Chicago: Art Institute of Chicago, 1906). On the merger of the School of the Art Institute and the Armour Institute, see Walter F. Shattuck and William K. Fellows, "The Chicago School of Architecture," *Brush and Pencil* 2, no. 1 (1898): 9–14.

¹⁸ On the Cooper Union Museum of the Arts of Decoration, see Elizabeth M. Keslacy, “The Architecture of Design: The Cooper Hewitt, Smithsonian Museum of Design (1896-1976)” (Ph.D., University of Michigan, 2016).

¹⁹ Stephen L. Dyson, *Ancient Marbles to American Shores: Classical Archaeology in the United States* (Philadelphia: University of Pennsylvania Press, 1998).

²⁰ Charles C. Perkins, “American Art Museums,” *The North American Review* 228 (July 1870): 8.

²¹ Perkins, 27–28.

²² Born, “The Canon Is Cast,” 8. See also Walter Muir Whitehill, *Museum of Fine Arts, Boston: A Centennial History* (Cambridge, Mass: Belknap Press, 1970).

²³ Born, “The Canon Is Cast,” 10.

²⁴ See the 1870 Act of Incorporation, described in Calvin Tomkins, *Merchants and Masterpieces: The Story of the Metropolitan Museum of Art*, 1st ed. (New York: E. P. Dutton, 1970), 21–23.

²⁵ “Metropolitan Museum of Art Annual Report, 1876” (New York: Metropolitan Museum of Art, 1876), 44, Museum Archives.

²⁶ Tomkins, *Merchants and Masterpieces*, 71.

²⁷ *Special Committee to Enlarge Collections of Casts. Report of Committee to Members and Subscribers, February 1, 1892.* (Metropolitan Museum of Art, 1892).

²⁸ Joseph V. Noble, “A New Gallery of Models and Casts,” *The Metropolitan Museum of Art Bulletin* 18, no. 4 (1959): 139.

²⁹ Flour, “On the Formation of a National Museum of Architecture,” 234. Flour’s analysis accords with that of Miles Orvell, a historian of American photography. He writes, “A major shift occurred within the arts and material culture for the late nineteenth century to the twentieth century, a shift from a culture in which the arts of imitation and illusion were valorized to a culture in which the notion of authenticity became of primary value. One might describe this change, in rough terms, as a change in the meaning of a phrase that remains central to both nineteenth- and twentieth-century culture, ‘the real thing.’ Put simply, the nineteenth-century culture of imitation was fascinated by reproductions of all sorts—replicas of furniture, architecture, art works, replicas of the real thing in any shape or form imaginable. It was a culture inspired by faith in the power of the machine to manufacture a credible simulacrum; yet it had not fully absorbed the methods of the machine, and in the end it was a culture of types, of stylizations, of rounded generalities. The culture of authenticity that developed at the end of the century and that gradually established the aesthetic vocabulary that we have called ‘modernist’ was a reaction against the earlier aesthetic, an effort to get beyond mere imitation, beyond the manufacturing of illusions, to the creation of more ‘authentic’ works that were themselves real things.” *The Real Thing: Imitation and Authenticity in American Culture, 1880-1940*, Twenty-fifth Anniversary edition (Chapel Hill: The University of North Carolina Press, 2014), xv.

³⁰ Tomkins, *Merchants and Masterpieces*, 99–100. See also Carol Duncan, “Public Spaces, Private Interests: Municipal Art Museums in New York and Chicago,” in *Civilizing Rituals: Inside Public Art Museums*, 1 edition (London ; New York: Routledge, 1995), 48–71.

³¹ The innovation was closely associated with Fiske Kimball and the Philadelphia Museum of Art. See David L. Barquist, “Period Room Architecture in American Art Museums,” *Winterthur Portfolio* 46, no. 2/3 (2012): 113–16, <https://doi.org/10.1086/668643>.

³² The Met has recently sold its architectural plaster cast collection to a number of different universities, including the University of Notre Dame, where there is an architecture department committed to the continuation of classical design. See “History in Plaster: The School’s Collection of Casts // News // School of Architecture // University of Notre Dame,” June 13, 2019, <https://web.archive.org/web/20190613225131/https://architecture.nd.edu/news-events/news/history-in-plaster-the-school-s-collection-of-casts/>.

³³ Mark Wigley, “Prosthetic Theory: The Disciplining of Architecture,” *Assemblage*, no. 15 (1991): 20.

³⁴ Wigley, 15.

³⁵ William R. Ware, “The School of Architecture in Its New Quarters,” *School of Mines Quarterly* 19 (1898): 289–90.

³⁶ On portraits of architects, see Andrew Saint, *The Image of the Architect* (New Haven: Yale University Press, 1983).

³⁷ Kenneth Hafertepe and James F. O’Gorman, eds., *American Architects and Their Books to 1848*, Studies in Print Culture and the History of the Book (Amherst: University of Massachusetts Press, 2001), xvi. See also Kenneth Hafertepe and James F. O’Gorman, eds., *American Architects and Their Books*,

1840-1915, *Studies in Print Culture and the History of the Book* (Amherst: University of Massachusetts Press, 2007). On print-media in the antebellum period, see Dell Upton, "Pattern Books and Professionalism: Aspects of the Transformation of Domestic Architecture in America, 1800-1860," *Winterthur Portfolio* 19, no. 2/3 (1984): 107–50.

³⁸ Henry Russell Hitchcock, *American Architectural Books: A List of Books, Portfolios, and Pamphlets on Architecture and Related Subjects Published in America before 1895*, Expanded edition, Da Capo Press Series in Architecture and Decorative Art (New York: Da Capo Press, 1976); Daniel D. Reiff, *Houses from Books: The Influence of Treatises, Pattern Books, and Catalogs in American Architecture, 1738-1950*, 1 edition (University Park, Pa: Penn State University Press, 2000).

³⁹ Donald E. Oehlerts, *Books and Blueprints: Building America's Public Libraries*, Contributions in Librarianship and Information Science, no. 69 (New York: Greenwood Press, 1991), 6; William Coolidge Lane, *Gore Hall: The Library of Harvard College, 1838-1913*. (Cambridge: Harvard University Press, 1917).

⁴⁰ Michael J. Lewis, "Frank Furness and the Expandable Library," *Journal of the Society of Architectural Historians* 77, no. 2 (June 2018): 138–45.

⁴¹ "The Best Twenty Books for an Architect's Library," *The American Architect and Building News* 21, no. 581 (February 12, 1887): 81; T. Roger Smith, "An Architect's Library," *Architecture and Building* 19, no. 24 (December 9, 1893): 279–82.

⁴² Smith, "An Architect's Library," 279. Smith's article was published a year after the controversial publication Richard Norman Shaw and Thomas Graham Jackson, *Architecture: A Profession or an Art? Thirteen Short Essays on the Qualifications and Training of Architects* (London: J. Murray, 1892). This collection was a protest against R.I.B.A.'s mandatory licensing examination. For a discussion of architectural professionalism in Britain in this moment, see Mark Crinson and Jules Lubbock, *Architecture: Art or Profession? : Three Hundred Years of Architectural Education in Britain* (Manchester, UK; New York : New York: Manchester University Press, 1994). I am borrowing the phrase "the order of books" from Roger Chartier, *The Order of Books: Readers, Authors, and Libraries in Europe Between the 14th and 18th Centuries*, 1 edition (Stanford, Calif: Stanford University Press, 1994).

⁴³ Avery Library, *Catalogue of the Avery Architectural Library. A Memorial Library of Architecture, Archæology, and Decorative Art*. (New York: Library of Columbia College, 1895), xiii.

⁴⁴ Avery Library, x.

⁴⁵ Avery Library, xii. For more on Prescott's life, see "Harriet Beardslee Prescott (1866 – 1958) – Women in the Stacks," June 14, 2019, <https://web.archive.org/web/20190614160508/https://womeninthestacks.wordpress.com/2018/01/06/harriet-beardslee-prescott-1866-1958/>.

⁴⁶ Avery Library, *Catalogue of the Avery Architectural Library. A Memorial Library of Architecture, Archæology, and Decorative Art.*, ix.

⁴⁷ Smith's letter appears in "Henry Ogden Avery Architectural Drawings and Papers, 1872-1890."

⁴⁸ Smith's background was unusual for an architecture librarian. The son of a New England missionary in Syria and biblical archaeologist, Smith graduated from Amherst in 1876 and studied decorative sculptor in Munich and Florence. After attempting a career as an artist, Smith became a librarian. Hamlin writes, "A scholar above all, he found in his appointment to the Avery Library the best possible field for study and for usefulness. He was perhaps the most widely-informed scholar in the country on the whole field of the fine arts. He came to know practically every book in the Library, and was able to advise any reader where to find the information on any subject covered by the treasures of the Library. His service to readers and students was patient, painstaking, genial and efficient. A great host of architects and all the older graduates of the School of Architecture will mourn the loss of one to whom they owed a great measure of gratitude and even affection." A. D. F. Hamlin, "Edward Robinson Smith," *Columbia Alumni News* 12, no. 28 (April 29, 1921): 446.

⁴⁹ Although most sociologists of architecture and historians of the profession overlook the importance of physical capital, Abbott emphasizes its importance in the development of professional expertise. He writes "Professional work may seem dependent on human capital alone; indeed Marxists generally argue that professions metamorphose expertise into property. But physical capital has become steadily more necessary to professional work in the last century. There have always been churches and libraries and hospitals. But modern medicine with its machinery, computing (for a while) with its mainframes, engineering with its gadgetry, and musicians with their studios all require vast investments in physical material. Once these materials were owned by small local governments, or professional or non-profit

organizations--county law libraries, community hospitals, local churches. The earliest large-scale piece of professional capital was a state property--the mental hospital--without which no nineteenth-century doctor could call himself a psychiatrist. But in the twentieth century, this capital, most of it absolutely necessary to successful professional practice, is normally owned by either governments or commercial organizations. This ownership of the means of professional production has vastly increased the dependence of professionals on organizations." Andrew Abbott, *The System of Professions: An Essay on the Division of Expert Labor* (Chicago: University of Chicago Press, 1988), 156.

⁵⁰ Robert A. McCaughey, *Stand, Columbia: A History of Columbia University in the City of New York, 1754-2004*, First Printing (New York: Columbia University Press, 2003), 177-211.

⁵¹ James F. O'Gorman, *The Architecture of the Monastic Library in Italy, 1300-1600: Catalogue with Introductory Essay*, Monographs on Archaeology and Fine Arts 25 (New York: New York University Press for the College Art Association of America, 1972), 6.

⁵² On the research university and information management, see Chad Wellmon, *Organizing Enlightenment: Information Overload and the Invention of the Modern Research University*, 1 edition (Baltimore: Johns Hopkins University Press, 2015). On the design and construction of Columbia's Morningside Heights campus, see Barry Bergdoll, *Mastering McKim's Plan: Columbia's First Century on Morningside Heights* (New York: Wallach Art Gallery, 1998); Francesco Passanti, "The Design of Columbia in the 1890s, McKim and His Client," *Journal of the Society of Architectural Historians* 36, no. 2 (1977): 69-84.

⁵³ Kenneth A. Breisch, *Henry Hobson Richardson and the Small Public Library in America: A Study in Typology* (Cambridge, Mass: MIT Press, 1997), 16.

⁵⁴ "As memorial buildings, all of Richardson's libraries likewise represented a significant, sentimental manifestation of the Victorian cult of mourning. By invoking the powerful image of death, their new commemorative function transformed them into quasi-religious institutions, a concentrated reflection of the sacralization of culture that has been identified as one of the hallmarks of late nineteenth-century American society. The institutional roots of this ritualization of death and commemoration, in fact, extend back to the rural cemetery movement, which was founded in this country in the Boston area with the opening of Mount Auburn Cemetery in 1831" (41).

⁵⁵ Abigail A. Van Slyck, *Free to All: Carnegie Libraries & American Culture, 1890-1920*, First Edition (Chicago: University of Chicago Press, 1998). Breisch also addresses Richardson's use of the alcove layout in *Henry Hobson Richardson and the Small Public Library in America*.

⁵⁶ Elisa Tamarkin, *Anglophilia: Deference, Devotion, and Antebellum America* (Chicago: University of Chicago Press, 2008).

⁵⁷ Montgomery Schuyler, "New York City Colleges," *The Architectural Record*, Architecture of American Colleges, 27, no. 6 (June 1910): 447.

⁵⁸ On the "prevalent Victorian preoccupation with distinctly modern practices of detachment," see Amanda Anderson, *The Powers of Distance: Cosmopolitanism and the Cultivation of Detachment* (Princeton, N.J: Princeton University Press, 2001). On the fascination of late-nineteenth-century Americans with the medieval, see T. J. Jackson Lears, "The Morning of Belief: Medieval Mentalities in a Modern World," in *No Place of Grace: Antimodernism and the Transformation of American Culture, 1880-1920* (Chicago: University of Chicago Press, 1994), 141-82.

⁵⁹ See the entry for "Alcove" in James Stevens Curl and Susan Wilson, *The Oxford Dictionary of Architecture*, 3 edition (New York, NY: Oxford University Press, 2016), 15.

⁶⁰ For a historical overview of the library typology in architecture, see James W. P. Campbell and Will Pryce, *The Library: A World History*, First Edition edition (Chicago: University of Chicago Press, 2013). Nikolaus Pevsner also provides a helpful overview of library architecture in Nikolaus Pevsner, *A History of Building Types*, Reprint edition (Princeton: Princeton University Press, 1979), 91-120.

⁶¹ On the electrification of New York and its architectural ramifications, see Sandy Isenstadt, *Electric Light: An Architectural History* (Cambridge, Massachusetts: The MIT Press, 2018).

⁶² Percy Stuart, "Architectural Schools in the United States.--Columbia University," *Architectural Record* 10, no. 1 (July 1900): 2.

⁶³ Stuart, 14.

⁶⁴ Stuart, 6.

⁶⁵ Stuart, 9-10.

⁶⁶ Lawrence W. Levine, *Highbrow/Lowbrow: The Emergence of Cultural Hierarchy in America*, The William E. Massey, Sr. Lectures in the History of American Civilization 1986 (Cambridge, Mass: Harvard

University Press, 1990), 60. Levine's historical analysis was based on the work of environmental psychologist Robert Sommer. He writes, "[Sommer] has shown the connections between space and status and has argued that 'society compensates for blurred social distinctions by clear spatial ones.' Such scholars as Burton J. Bledstein and William R. Taylor have noted the Victorian urge to structure or rationalize space. As the traditional spatial distinctions among pit, gallery, and boxes within the theater were undermined by the aggressive behavior of audiences caught up in the egalitarian exuberance of the period and freed in the atmosphere of the theater from many of the demands of normative behavior, this urge gradually led to the creation of separate theaters catering to distinct audiences and shattered for good the phenomenon of theater as social microcosm of the entire society" (60).

⁶⁷ Stuart, "Architectural Schools in the United States.--Columbia University," 11.

⁶⁸ Stuart, 11.

⁶⁹ Henry Van Brunt, *Greek Lines and Other Architectural Essays* (Boston, New York: Houghton, Mifflin and company, 1893), 236.

⁷⁰ Tanzer's archival discovery is mentioned in Pierre de la Ruffinière du Prey, *The Villas of Pliny from Antiquity to Posterity*, 1 edition (Chicago: University of Chicago Press, 1995), 215. Helen Henrietta Tanzer, *The Villas of Pliny the Younger* (Columbia University Press, 1924).

⁷¹ Du Prey writes, "By Pliny's time the written description of a work of art, called *ekphrasis* by the Greeks, had become a standard literary formula, and so it continued well into the Byzantine era. In general terms *ekphrasis* had focused on paintings, sculptures, interior decoration, and cityscapes. (Homer's description of Achilles' shield established a famous early precedent.) Pliny changed that once and for all by devoting lengthy passages, even whole letters, to the architecture of villas and their relation to the landscape setting. He thereby virtually invented architectural description as a separate subcategory of *ekphrasis*. His approach, moreover, differed diametrically from that of the most famous architectural writer up until then, his great predecessor Vitruvius. In *De architectura*, Vitruvius emphasized such dry technical information as siting, proper foundations, drainage, structure in general and the use of the orders of architecture in particular. Pliny adopted an entirely more sensuous—one is tempted to say impressionistic—attitude to architecture. That Vitruvius's writings escape mention in the letters probably means that Pliny was ignorant of them. He took the approach of a gifted amateur: one strong on conveying the general atmosphere of a building but weak on specifying its precise appearance. His letters, for instance, ignore structure almost totally, and rarely do they hint at even so fundamental a feature as the column. Pliny thought mainly in flat, planimetric terms, as untrained persons tend to do when attempting to design their own houses. His descriptions speak most often of simple sequences of spaces. He succeeded better when it came to garden areas, where at least the plants' botanical species automatically supply clues to shape, color, and aroma. Even so, the garden settings often sound like rooms with the ceilings left off. Pliny rendered one-dimensional what are by nature the three-dimensional arts of building and landscape architecture" (8-9).

⁷² William R. Ware, "The Study of Architectural History at Columbia College," *School of Mines Quarterly* 17 (November 1895): 61.

⁷³ On the discourse of empathy and the influence of German psychology on modern architects, see Mark Jarzombek, *The Psychologizing of Modernity: Art, Architecture and History* (Cambridge, U.K. ; New York: Cambridge University Press, 1999); Mark Jarzombek, "De-Scribing the Language of Looking: Wölfflin and the History of Aesthetic Experientialism," *Assemblage*, no. 23 (1994): 29–69.

⁷⁴ Ware, "The Study of Architectural History at Columbia College," 62.

⁷⁵ William R. Ware, "Drawing, Designing, Thinking," *The Architectural Record* 26, no. 3 (September 1909): 161.

⁷⁶ Ware, "The Study of Architectural History at Columbia College," 64.

⁷⁷ Smith used this phrasing in Edward R. Smith, "The Henry O. Avery Architectural Library of Columbia University," *Journal of the Royal Institute of British Architects* 21, no. 3 (June 1914): 497.

⁷⁸ Talbot Hamlin, "Avery Hall," *Columbia University Quarterly* 12 (September 1912): 400.

⁷⁹ Hamlin, 401.

⁸⁰ Anthony Alofsin, *The Struggle for Modernism: Architecture, Landscape Architecture, and City Planning at Harvard* (New York: W.W. Norton, 2002), 31.

⁸¹ Stuart, "Architectural Schools in the United States.--Columbia University," 16–17.

⁸² Hamlin, "Avery Hall," 401.

⁸³ Talbot Hamlin, "Hamlin Report," April 1904, School of the Arts records, 1895-1997; Series II: Department of Fine Arts, 1895-1959, Columbia University Archives.

⁸⁴ Cooke wrote, "In the case of a library, for instance, arrangements could be made for securing a tally on the number of persons using the library, the number of books called for, the number of books bought, etc. Some index should be provided to measure every line of the library's activity. The time seems to have gone by when we can afford to maintain features which are not definitely useful and in which their usefulness does not bear the proper relation to their expense. If we know the total cost of each, and then make some effort to measure the product, it will be possible to decide whether the product seems to warrant the expense. If every university would do this, each could decide, by comparison with the experience of the others, how efficiently its own departments are being operated. It is desirable to have a library, but we want to be sure that a library which is costing ten times what another costs is doing 'work' in proportion." Morris Lyewellyn Cooke, *Academic and Industrial Efficiency; a Report to the Carnegie Foundation for the Advancement of Teaching* (New York: Carnegie Foundation for the Advancement of Teaching, 1910), 55.

⁸⁵ Hamlin's definition of the library appears in the essay "Some Essentials of Library Design," included in Snead & Company, ed., *Library Planning, Bookstacks and Shelving* (Jersey City, N. J.: The Snead & Company Iron Works, 1915), 103. This text served as publicity material for the Snead & Company Iron Works, the largest manufacturer of custom built library stacks in the 1910s and 1920s, as well as other library equipment.

⁸⁶ Reginald Theodore Blomfield, *The Mistress Art* (London: E. Arnold, 1908), 23.

⁸⁷ My use of the term "bibliophobia" is inspired by Joseph Rykwert's reference to "bibliophilia" in Joseph Rykwert, "The Roots of Architectural Bibliophilia," *Scroope* 8 (1996): 111–17.

⁸⁸ For an account of architectural professionalism in Britain, see Crinson and Lubbock, *Architecture*. The original publication is Shaw and Jackson, *Architecture a Profession or an Art*. The epigram printed on this publication's cover is "...ego nec studium sine divite vena nec rude possit video ingenium....," a line from Horace that means "I see not what good can come from study without a rich vein of genius or from genius untrained by art...".

⁸⁹ John Dewey, *The School and Society and The Child and the Curriculum*, 1 edition (Chicago: University of Chicago Press, 1991), 85.

⁹⁰ Quoted in W. Norton Grubb and Marvin Lazerson, *The Education Gospel: The Economic Power of Schooling* (Cambridge, Mass: Harvard University Press, 2004), 9–10.

⁹¹ Granville Stanley Hall, *Educational Problems* (New York, London: D. Appleton and company, 1911), 443.

⁹² Narciso G. Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan* (Madison: University of Wisconsin Press, 1981).

⁹³ Louis H Sullivan, *The Autobiography of an Idea* (New York: Dover Publications, 1956), 120.

⁹⁴ Louis Sullivan, "Emotional Architecture as Compared with Intellectual: A Study in Subjective and Objective," *The Inland Architect and News Record* 24 (November 1894): 32–34. Reprinted in Louis Sullivan, *The Public Papers*, ed. Robert Twombly, 1 edition (Chicago: University of Chicago Press, 1988), 100.

⁹⁵ Sullivan, *The Autobiography of an Idea*, 200.

⁹⁶ Sullivan, 200.

⁹⁷ Ralph Waldo Emerson, *Emerson: Essays and Lectures: Nature: Addresses and Lectures / Essays: First and Second Series / Representative Men / English Traits / The Conduct of Life* (New York: Library of America, 1983).

⁹⁸ Sullivan, *The Public Papers*, xv.

⁹⁹ Lorraine Daston and Peter Galison, *Objectivity* (New York, NY: Zone Books, 2010), 120.

¹⁰⁰ Louis Sullivan, "Style," *The Inland Architect and News Record* 11 (May 1888): 59–60. Reprinted in Sullivan, *The Public Papers*, 64.

¹⁰¹ Louis Sullivan, "The Artistic Use of the Imagination," *Building* 11 (October 19, 1889): 129–30. Reprinted in Sullivan, *The Public Papers*, 64. On the philosophical complications surrounding the category of experience in the nineteenth and twentieth centuries, see Martin Jay, *Songs of Experience: Modern American and European Variations on a Universal Theme*, First edition (Berkeley, Calif: University of California Press, 2005).

¹⁰² Sullivan, "Emotional Architecture as Compared with Intellectual: A Study in Subjective and Objective." Reprinted in Sullivan, *The Public Papers*, 89.

¹⁰³ Louis Sullivan, "The Young Man in Architecture," *The Inland Architect and News Record* 35 (June 1900): 38–40. Reprinted in Sullivan, *The Public Papers*, 137.

¹⁰⁴ Louis Sullivan, "The Tall Office-Building Artistically Considered," *Lippincott's Magazine* 57 (March 1896): 403–9. Reprinted in Sullivan, *The Public Papers*, 107.

¹⁰⁵ Sullivan, *The Public Papers*, 109.

¹⁰⁶ Frank Lloyd Wright, *An Autobiography* (New York: Horizon Press, 1977), 45.

¹⁰⁷ Wright, 45.

¹⁰⁸ Wright, 78.

¹⁰⁹ Wright, 78.

¹¹⁰ Identifying the philosophical and scientific basis of architectural bibliophobia would require an essay unto itself. Start with Donald Drew Egbert, "The Idea of Organic Expression and American Architecture," in *Evolutionary Thought in America*, ed. Stow Persons, Edited for the Special Program in American Civilization at Princeton University (New York: G. Braziller, 1956). Egbert writes, "In the first place, there is the belief that the process of creation should be natural in being intuitive, and not—as the Renaissance humanist would ordinarily have it—in being based on abstractly rational principles which can be codified and learned from books. Moreover, dislike of such codification can, in a negative way, help to encourage belief in change and evolution. All this is illustrated by such statements of Sullivan as: 'To create is an absolutely natural process'; and again, '...we in our art are to follow Nature's processes, Nature's rhythms, because those processes, those rhythms, are vital, organic, coherent, logical above all book logic...' And he also said, 'In Darwin he [Sullivan] found much food. The Theory of Evolution seemed stupendous.' Taken together, all these statements suggest not only a belief in evolution, but a kind of evolution with vitalistic overtones not found in Darwin's own thought" (352). On vitalist organicism in Europe, see also Caroline van Eck, *Organicism in Nineteenth-Century Architecture: An Inquiry into Its Theoretical and Philosophical Background* (Amsterdam: Architectura & Natura Press, 1994).

¹¹¹ Eck makes this astute point in *Organicism in Nineteenth-Century Architecture*, 258. "Modernism formulated the problem of invention in architecture no longer in terms of choice from a plurality of styles determined by notions like *convenance*, decorum, or character, but in terms of objectivity, truth, functionality, and design."

¹¹² Percy Stuart, "University of Pennsylvania.--No. 2.," *The Architectural Record*, Architectural Schools in the United States, 10, no. 1 (July 1900): 328–29. On the Ricker Library at the University of Illinois, see Bryan E. Norwood, "Inventing Professional Architecture," in *The University of Illinois*, ed. Frederick E. Hoxie, Engine of Innovation (University of Illinois Press, 2017), 93–100.

¹¹³ Mariana Griswold Van Rensselaer, *Henry Hobson Richardson, and His Works* (Boston, New York: Houghton, Mifflin and Company, 1888), 131.

¹¹⁴ Van Rensselaer, 131.

¹¹⁵ Van Rensselaer, 130.

¹¹⁶ William R. Ware, "The Columbia University School of Architecture," *The American Architect and Building News* 61, no. 1180 (August 6, 1898): 44.

¹¹⁷ Ware, 45.

¹¹⁸ Ware, 45.

¹¹⁹ In lieu of a detailed explanation of Weber's tripartite model of authority—traditional, rational, and charismatic—see Max Weber, *Max Weber on Charisma and Institution Building: Selected Papers*, ed. S. N. Eisenstadt (Chicago: University of Chicago Press, 1968). As a counterbalance to the institutional growth in the Progressive Era, see also Warren Susman, "'Personality' and the Making of Twentieth-Century Culture," in *Culture as History: The Transformation of American Society in the Twentieth Century*, 1st edition (Washington: Smithsonian Books, 2003).

Conclusion

Captains of Erudition and the Collar Line

Ware's career in education ended during a period when architecture was becoming increasingly affiliated in the United States with the fine arts. In the 1860s and 1870s, architecture found a foothold within new institutions of higher learning like the Massachusetts Institute of Technology because of public commitment to supporting the useful arts, specifically drawing reform. In the 1880s and 1890s, at elite institutions like Columbia, architecture expanded within the setting of modern research university through new affiliations with other professional schools and the liberal arts that collections like the Avery Library supported. After the turn of the century, however, the tenor of education reform at places like Columbia changed and the study of architecture as a fine art came to be associated with a new, more stratified understanding of cultural democracy. When this change occurred, the liberal course of study that Ware envisioned for American architects continued, but it no longer served as a broad middle ground that connected the various constituents of the architectural community in their pursuit of culture, from draftsmen and special students to classical archaeologists and privileged few who had returned from Paris. Now beauty was the watchword, not culture, and liberal study was merely preparation for the advanced pursuit of architecture as a fine art.

Ware's historicist curriculum at Columbia reached its height when Seth Low was president of the university. Low became president in 1890, having previously served as mayor of Brooklyn. As one might expect from academic president with a background in municipal politics, for Low the university was an instrument of urban reform. At a time when the labor question was everywhere devolving into violent conflict, when Chicago architects and contractors tried their best to undermine trade unionism in their city, Low wanted the university to address the most pressing social problems facing New York and for scholarship to speak directly to "the workingman."¹ One way that he tried to accomplish this latter ambition was strengthen Columbia's extension programs, which Barnard had reinstated in 1885. Extension programming initially included Saturday morning public lectures and recitals and then grew over the next two decades with the creation of credit-granting summer session courses, an Institute of Arts and Sciences that offered brief enrichment courses around Manhattan, and through Columbia's official affiliation with the Industrial Education Association in 1898, which later became Teachers College. By 1914, Columbia was offering extension programs as far afield from Morningside Heights as Brooklyn, Newark, and Buffalo.²

Perhaps because Ware sympathized with Low's commitment to public outreach and observed the development of Columbia's many extension programs throughout the 1890s, he began to work on behalf of the International Correspondence School of Scranton, Pennsylvania (I.C.S.; FIGURES 75-76) in addition to directing Columbia's architecture school. Thomas J. Foster, the owner of the Colliery Engineer Company,

created the I.C.S. as a means for training miners in and around Western Pennsylvania in safety protocols and the basics of mining engineering. Soon, however, Foster recognized that he could leverage federal subsidies for United States Postal Service programs like Rural Free Delivery to expand the market for his courses and provide Americans from working-class and agricultural backgrounds across the country with cheap and convenient technical training in a wide variety of fields. This was during the same period when suburban mail-order houses, first introduced in the 1870s and similarly dependent on new railroad delivery systems, reached the height of their popularity.³ As the I.C.S. acquired its own faculty, it contracted subject area specialists to design courses and hired a corps of trained examiners (most of whom were women) at the headquarters in Scranton to process student exercises and provide feedback. As of 1905, student enrollment in I.C.S. reached 800,000 and the company included 2,650 employees. Between 1890 and 1940, Watkinson claims that over four million students enrolled in I.C.S. courses, seeking to improve upon their working-class status, “perhaps disillusioned by unfulfilled union promises, notorious union defeats, and bleak prospects for promotion and social mobility.”⁴ Other companies in the expanding distance-learning sector included the American Correspondence School at the Armour Institute of Technology in Chicago (FIGURE 77).

In the spring of 1894, the I.C.S. founded a School of Architecture. Sometime in the mid-1890s, the I.C.S. must have contacted Ware and asked him to consult on the preparation of an introductory textbook for its “Complete Architectural Course.” In 1899, this textbook was released anonymously in eight volumes under the title *A Treatise on Architecture and Building Construction*. Like all I.C.S. courses, the authors of this text had to assume that students enrolled with no prior knowledge of either architecture or the basic set of math and drawing skills used to complete an architectural exercise, such as arithmetic and geometry. After introducing these subjects, I.C.S.’s “Complete Architectural Course” then proceeded to common formulas in architectural engineering, such as the stress load of an I-beam, before moving on to an overview of masonry, carpentry, iron and other kinds of metalwork, electrical wiring, plumbing, heating and ventilation, painting and decoration, estimating cost and calculating quantities of materials. Only in the fifth volume of the “Complete Architectural Course” did the student begin to study architecture proper, starting with the history of architecture, the design of architectural elements, and the different historic styles of ornamentation.⁵

Members of the architecture profession seemed to welcome the I.C.S. School of Architecture as a supplement to the collegiate programs, or at least there is no published evidence that collegiate educators complained about its presence. In 1900, a notice for the I.C.S.’s “Architectural Drawing and Design Course” appeared in “The Directory of the Architectural Annual,” a publication for the Architectural League that featured “A Condensed Report of the Work of the Leading Architectural Societies and Schools of the Country.” Following reviews of Columbia, Cornell, the University of Pennsylvania, and other established schools of architecture, the editors of the League’s Directory suggested that at a cost of \$40, \$45, \$50, or \$55—depending on the student’s preferred payment plan—I.C.S. courses might be a good investment for those looking to

begin their architectural training prior to enrolling in a more expensive brick-and-mortar program. They wrote:

Correspondence education, with a persevering student at one end of the line and a broad-minded and experienced management at the other, is productive of large practical results. The courses are not intended as substitutes for college or resident technical school courses, but represent the night work of advanced artisans ambitiously inclined. They furnish to artisans and practical workers in the various divisions of the architectural profession specialization education in the scientific principles underlying their work and their practical application. As the courses begin with arithmetic, the only qualification required of the student is the ability to read and write English and persevering application to study.⁶

Ware would go on to publish *Shades and Shadows* with I.C.S in 1912, a text that explained to students who had already begun to study architecture how to render objects in three-dimensions based on trigonometry. *Shades and Shadows*, like *A Treatise on Architecture and Building Construction* (FIGURES 78-79), represented Ware's ongoing commitment, first announced in his *Outline of a Course* for M.I.T., to a system of architectural education that prepared competent draftsmen to enter into practice as much as it did architectural designers. As much as Ware was himself interested in the growth of the discipline as a fine art, he recognized that the realization of the aesthetic ideal depended in practice on the continuation of the useful art and liberal art traditions. The three categories of the useful, liberal, and fine arts were not related to each other in Ware's pedagogical imagination as sequence of development but as a composite, each layered with the other two.

But while Ware worked to democratize architectural expertise after he secured his discipline the institutional support of the university, with his persistent idealism he failed to sufficiently appreciate that architecture by the turn of the century had begun to symbolize cultural division. The marketing directors that designed advertisements for I.C.S. did not share the same myopia. They knew that the market for correspondence education was growing in relation to the deepening of a "collar line" that separated the worlds of mental and manual workers in the Gilded Age, amidst extreme labor volatility and increasing concerns about the new waves of immigration to the United States (Ellis Island opened in 1892 and the rate of European immigration to the country peaked around 1907).⁷ According to labor historian Jurgen Kocka, "white-collar" was first used by American factory workers, or "blue-collars," around the turn of the century as a term of derision for former colleagues who had left the shop floor and their hourly wages to become salaried, technical draftsmen in offices. Soon, "white-collar" came to signify all forms of non-manual or clerical labor in office settings.⁸ When the I.C.S. publicized their Complete Architectural Course in journals like the *American Federationist* (the official magazine of Samuel Gompers's American Federation of Labor), *The National Builder*, and the *Architect's and Builder's Magazine*, it projected an image of the architect that aimed to stoke fantasies about crossing the collar line and entering a world of middle-class respectability. One I.C.S. advertisement that appeared in *Wilshire's Monthly*, a socialist periodical, was entitled "Telegrapher to Architect Through the I.C.S." (FIGURE

80).⁹ The short narrative presented in the advertisement's copy presented a variation on a prototypical theme in which a white-man employed in a rote, manual, or otherwise low-paying job turns to correspondence education to increase his wages and social status. In this case, the job is telegraphy, which by the early 1900s was an occupation increasingly associated with women.¹⁰ The layout of the image mimics that of a plinth and bust. The plinth is composed of three sections: a student testimonial, a direct appeal to the reader, and a coupon that the reader could cut out and send to the I.C.S. in order to receive free course material. The bust is a collage of a drawn outline of an upper chest and a photographic head. The young man, named John Tibbets of Fairmount, West Virginia, a principal of the firm Lyons & Tibbets, possesses sharp features and is well groomed. He wears a poke-imperial collar, an Edwardian fashion, a tie, and an unstructured drafting coat with wide lapels. It is the image of a posh English architect as a prospective I.C.S. student might unknowingly imagine him much more than an actual depiction of a country architect from West Virginia.¹¹

Other I.C.S. advertisements deployed the image of the architect similarly, as the personification of social mobility for aspiring young white tradesmen. One advertisement that appeared in Chicago's *The National Builder* in 1903 is entitled "Carpenter Becomes Architect" (FIGURE 81). In his testimonial, F.L. Lindsay of Watertown, Wisconsin, another well-groomed, well-dressed, young white man reads:

I learned the carpenter's trade while quite a young man. I soon felt keenly the need of a technical education, to master the problems in my work. Not being able to attend college, I had about concluded to give up when a friend handed me one of the circulars of the Schools. I at once decided to take the Architectural Drawing and Designing Course. The Course has been worth several times the cost to me. In a short time I was able to master difficult problems, my business became remunerative, and my prospects brightened. I now have an architect's office in this city, and am doing good business. I will gladly reply to any letters regarding the School.¹²

Here the ad-copy narrates an occupational conversion story wherein Lindsay receives the ICS circular like the holy gospel, as salvation for his ignorance and financial insecurity. Other advertisements that appeared on the I.C.S.'s page seven spread in *The National Builder* associated education with liberation and self-determination. One, entitled "Are You Held Down," shows a man pressed to the floor by a giant thumb (FIGURE 82).¹³ Another asks the reader, "Are you a cog?" (FIGURE 83).¹⁴

For as much the I.C.S. promised to make architectural expertise more accessible, it also commoditized it, compromising Ware's nineteenth-century ideal of self-cultivation in the process of commoditizing knowledge. Again, the clearest expression of this transformation was in I.C.S.'s advertisements. One appeared in the *Architects' and Builders' Magazine* that was entitled "Better than Money: Architecture Taught by Mail" (Figure 84).¹⁵ "Technical knowledge cannot be lost or stolen," the ad-copy reads. "It can always be converted into cash." An Ionic capital, a token signifier for architecture and high culture more generally, appears in the advertisement as a double-entendre, a

suggestion of the higher value of learning to physical labor. The idea that the value of technical knowledge might be affected by geographic or cultural factors, or that learning, as the early history of Columbia's architecture school proves, requires a specific kind of social and spatial environment, was not something that a distance-learning school like the I.C.S. cared to acknowledge. The company was broadcasting to a market of young builders who wanted to get ahead and who could conceive of themselves as architects even if they could not imagine themselves as students within the collegiate system of architectural education.

As Ware continued to collaborate with I.C.S., university leadership at Columbia turned over. In 1901, Nicholas Murray Butler replaced Seth Low as the president after Low decided to run for mayor of New York City. Butler (FIGURE 85), an enormously ambitious administrator who Veblen famously lampooned as a "Captain of Erudition" (a reference to the robber-baron "captains of industry" like Cornelius Vanderbilt) in his *Higher Learning in America* (1918), did not share Low's patrician vision for the university as a tool of municipal improvement.¹⁶ According to one of his biographers, Butler was "unapologetically elitist," someone who "flourished as the ultimate insider, really only comfortable with the well-to-do and the well-connected, with men who felt that the world would be better of leaving them alone to run it."¹⁷ Butler wanted Columbia to become the leading university in the United States and he thought of himself as a world leader. To achieve his goal of university expansion, Butler fundraised to develop the Morningside Heights campus, recruited academic celebrities to join his faculties, and built up Columbia's endowment by revitalizing the alumni network and catering to New York's wealthiest philanthropists. Butler also tried to consolidate administrative power by eliminating faculty control of university appointments and tightly controlling departmental budgets, leading many subsequent historians to characterize him as an enemy of academic freedom.¹⁸ Ware, the son of New England Unitarians, who remained devoted to the scholarly ideal of the professional architect, was not the kind of academic celebrity that excited Butler. Neither was Butler impressed with the historicist orientation of Ware's department.

Butler envisioned Ware's department as the centerpiece of a grand school of fine arts, akin to the École and other national art schools. As early as 1896, when Low was still Columbia's president and Butler was affiliated with Teachers College, Butler had initiated discussions with the Metropolitan Museum of Art and the National Academy of Design about creating such a unified art school under Columbia's administration, including faculties of architecture, design, and music. Although the cash-strapped National Academy of Design was receptive to the idea, the Metropolitan was moving away from instruction (as discussed in Chapter Four), and nothing developed. After Butler became Columbia's president, however, he revisited the project and proposed the idea to the faculty at Columbia who would be involved. Hamlin was enthusiastic and promoted the School of Fine Arts idea on Butler's behalf, arguing to the readers of the *Columbia University Quarterly* that it was time for the university to serve as New York's "preeminent and controlling art force" and that there was a strong demand for university art instruction, "particularly among women."¹⁹ Like Hamlin, Ware and Edward MacDowell, a composer who was the head of Columbia's Department of Music, were

initially supportive of increasing university support for the study of the fine arts, but they grew concerned when Butler unilaterally removed their respective programs from their governing faculties (architecture was in the Faculty of Applied Science and music was in the Faculty of Philosophy) and placed them in a new Division of Fine Arts within the Teachers College, alongside Kindergarten Studies. The project did not proceed further, although Columbia did create a Department of Fine Arts in 1921 for undergraduate students in the humanities.²⁰ In hindsight, the School of Fine Arts campaign only proved to be more of an administrative scheme for Butler to further consolidate his control over the faculty than it was a reflection of growing American interest in artists and the fine arts.²¹ MacDowell resigned in 1903 in a wave of faculty protests against Butler's incursions—a foreboding sign for Ware.²²

Butler decided early in his presidency that he wanted to replace Ware with Charles McKim, for many at that time the most famous architect in the country, and he recruited McKim by supporting McKim's pet project to establish an American Academy in Rome. Like the École des Beaux Arts' Villa Medici, where the winners of the Prix de Rome studied, the American Academy would be a place for postgraduate work architecture, painting, and the decorative arts. At the American Institute of Architect's annual gala dinner in 1905 (FIGURE 86), for example, Butler lent his academic authority to the lobbying effort to get Congress to pass the American Academy's bill of incorporation. Knowing little more about architecture and its history than what he might have been able to learn in a week's worth of reading, Butler nonetheless declared that Americans were ready to celebrate beauty in architecture and in the other arts of design. "There was a time when use and beauty were not dissevered, as the great collections of antique objects that are beautiful, yet made for use, amply testify," Butler stated. "It was a loss for art and for refinement of living and of taste when the two grew apart; and it should be one of our tasks of today to follow the good example set by the French and to unite them again in all possible ways."²³ Over the next twenty years, rather than build upon the kinds of disciplinary connections that Ware and his faculty had made throughout the 1880s and 1890s, A.I.A. leadership would try to strengthen architecture's association with the fine arts, publishing texts like the Committee on Education's *The Significance of the Fine Arts* in 1903 as a textbook for American colleges.²⁴

McKim's vision for the American Academy was widely disputed around the turn of the century. The members of the Society of Beaux-Arts Architects thought that opportunities for advanced architectural study should be located in Paris, not Rome, and Ware, who served as the chairman of the American Academy's Board of Managers warned McKim that the policy of only accepting prize-winning students from Columbia and the University of Pennsylvania was blatantly elitist. "I have not met a single person," Ware wrote to McKim in 1894, "who does not cry out against what he regarded as the narrow, illiberal, exclusive, undemocratic, un-American character of our rule."²⁵ Ware's collaboration with the I.C.S. and McKim's efforts to establish the American Academy in Rome were pulling architectural education in diametrically opposed directions. For as much as Butler celebrated the unification of the useful and fine arts, he was, in actuality, building institutions that maintained their division. Ware, in contrast, was working to

widen the base of architectural practice, to transform architecture into a fine art from the bottom-up, albeit at the risk of commodifying the discipline.

Ware's involvement with I.C.S. seems to have abruptly ended his academic career insofar as it provided Butler with an alibi to advance his interests in McKim and a School of Fine Art. One day in 1903, at the age of 71 and still beloved by a vocal majority of students, Ware received notice that he was summarily dismissed from his position as the head of Columbia's School of Architecture. After thinking over the decision for a day, Ware, evidently still in state of psychological shock, went Downtown to find consolation in the sympathy of a former Columbia student and confidante, William T. Partridge, an architect who had recently worked on the McMillan Plan for Washington, D.C.²⁶ "Professor Ware came to my studio in great distress," Partridge wrote in his unpublished memoir,

He said that he had been forced to resign from the University. He explained that he had prepared his report, mentioned the project on which he was engaged and most interested, namely the use of the correspondence school as feeders to the Architectural School,—a sort of recognition of the schools of correspondence; that there had been no criticism or suggestion whatever made of his work; that he had laid his figures before them and made his bow and retired. Within half an hour after that, a messenger came with a polite note saying 'in the wisdom of the Board of Trustees, your resignation is requested.' He said, 'I was absolutely dumbfounded, as there was no criticism, no fault or censure or unfavorable opinion expressed upon the reading of my report. Though overwhelmed, I realized there was nothing else to do, so I sat and wrote that in view of the note which I had received, I regretted to tender my resignation to take effect, as is customary, one year from the date. In my mail the next morning I received a note from the Secretary of the Boar saying that 'the Trustees have received your letter of resignation and have decided that that resignation is to take place at once, and that you are hereby relieved from duty and appointed Professor Emeritus at a salary of \$-- a year.'

Mr. Ware came immediately to my studio and said, 'Partridge, I cannot believe that this has happened.' I have never been so agitated. In talking some years afterwards with one of the men most active on the Board of Trustees, I asked him what the reason for Mr. Ware's resignation. He said that the trustees felt that Mr. Ware was putting the college in an undignified position in carrying on negotiations with correspondence schools, but could not answer why Mr. Ware had not been checked; why, without criticism, should he have been suddenly fired? If the trustees did not believe in the policy which he was outlining, it certainly was in their power to inform him to that effect.

Professor Ware spent 21 years and all of his money for the benefit of the University. How much of his salary he put back for photographs, for student work, nobody knows, but it was a very large proportion...²⁷

After Ware's dismissal from Columbia, he retired to his home in Milton, Massachusetts where he lived with his sister, wrote two books that were published by I.C.S.—*The*

American Vignola in 1903 and *Shades and Shadows* in 1912—and continued to consult on architectural projects and competitions. According to official Columbia University documents and notices released by the architecture school, Ware retired due to “old age,” but he was not so aged as to be unable to serve, for example, an eight-week term in 1906 as the American representative on the jury for the Carnegie Foundation’s Peace Palace architectural design competition, the administrative building for The Hague in the Netherlands (Figure 87). Ware also continued to advise a network of protégés like Nathaniel Cortland Curtis at Tulane University who were leading newly-established collegiate architecture schools around the country. By 1910, Ware’s health did, in fact, start to decline and he died in 1915, twelve years after his dismissal, at the age of 83 (FIGURE 88).

Coda: Ware’s Legacy Today

The Ware Course describes one influential educator’s attempt to embed the discipline of architecture within the institutional structure of the American research university. During the post-bellum period, the architectural establishment in the United States, following Ware, turned to the university in order to separate themselves from builders, engineers, and fine artists and to redefine their expertise in professional terms, emphasizing their informed judgment rather than the possession of craft skill or technical knowledge. The collapse of the American apprenticeship system and the crisis of industrial skill provided an opportunity for Ware and other drawing reformers to elevate the status of architects and architectural knowledge. Once architecture entered the university, Ware tried to justify the discipline’s inclusion by creating a pedagogical system and a spatial apparatus that merged the world of design with the modern academic research imperative. The study of historic precedent and spaces like the Avery Library were central to this merger of architectural and academic culture, especially the text-based research culture of the humanities. The tenuous balance between design and research that Ware’s curriculum tried to maintain, however, did not last long.

With the rise of the Beaux-Arts design theory in the United States between 1900 and 1920, the subsequent enthusiasm for Bauhaus-inspired aesthetic modernism, and the pursuit of a strictly positivist notion of “research for architecture” following World War II, design and research drifted further apart. Just as American universities embraced the growing military-industrial complex, architecture schools embraced a more technocratic version of architectural expertise that brought the profession closer to the building industry. Increasingly, the explicit cultivation of judgment as the central characteristic of the professional architect’s identity became a liability. Some American educators, the foremost of which was László Maholy-Nagy at the School of Design in Chicago, sought to return architectural expertise to the tacit, bodily realm of craft experience and intuition, where judgment was, in a sense, pre-conscious.²⁸ Other educators in the 1960s and 1970s such as Leslie Martin at Cambridge University and Christopher Alexander at the University of California, Berkeley experimented with new structuralist ideas and computational tools, including early Computer-Aided Design (CAD) systems,

in order to create an “automatic architecture” that was less reliant on the frailty and capriciousness of individual judgment and thereby more objective.²⁹ Ware’s liberal vision would not resurface until another generation of architect-historians appeared in the heyday of Postmodernism, when the study of historic precedent became in vogue.

Today, architectural education in the United States is polarized between curricula that promote decontextualized digital experimentation and curricula that encourage students to approach their work as a form of social or ecological activism.³⁰ In this polarized field, the meaning of the architect as a cultural figure, a student of a tradition and an intellectual rather than a specialist or a building technician, remains unclear.

Endnotes to Conclusion

¹ Seth Low, "The University and the Workingman," *The Social Economist* 1, no. 1 (March 1891): 7–9. On Chicago architects and labor politics, see Joanna Merwood-Salisbury, *Chicago 1890: The Skyscraper and the Modern City*, First Edition (Chicago: University of Chicago Press, 2009).

² Frederick P. Keppel, *Columbia*, American College and University Series (New York: Oxford University Press, 1914), 137–38.

³ James L. Garvin, "Mail-Order House Plans and American Victorian Architecture," *Winterthur Portfolio* 16, no. 4 (1981): 309–34.

⁴ James D. Watkinson, "'Education for Success': The International Correspondence Schools of Scranton, Pennsylvania," *The Pennsylvania Magazine of History and Biography* 120, no. 4 (October 1996): 344. Watkinson contextualizes the growth of correspondence schools in this period in relation to the failure of previous responses to the collapse of the American apprenticeship system. He writes, "Workers who enrolled in correspondence schools sought a type of learning that would give them immediate socioeconomic mobility; they desired to enter the upper echelons of skilled occupations, or, more often, enter white-collar work without engaging in traditional apprenticeships or extended formal education. Educational reform efforts of the past, such as mechanics' institutes, lyceums, land-grant colleges, the relatively recent manual training, and the establishment of technical institutes like Pratt and Drexel, as well as free night schools like the Cooper Union, had failed to elevate the socioeconomic status of workers. In part this was because some had no intention of doing so, as was the case with mechanics' institutes, lyceums, and manual training, or, as with the land-grant schools and technical institutes, they failed to attract wage earners to their programs in significant numbers. Furthermore, all of these reforms rested on three long-held concepts: that there was dignity in manual labor; that education should impart 'useful knowledge,' understood as the idea that manual laborers needed higher education in order to dignify their labor; and, that a primary goal of education was moral uplift" (345).

⁵ *A Treatise on Architecture and Building Construction, Prepared for Students of the International Correspondence Schools, Scranton, PA.*, First Edition, vol. 1, 8 vols. (Scranton: The Colliery Engineer Co., 1899). "Vol. I. (1-6) contains the Instruction and Question Paper on Arithmetic, Formulas, Geometry and Mensuration, and Architectural Engineering; Vol. II (7-10) contains the Instruction and Question Papers on Masonry, Carpentry, and Joinery; Vol. III (11-15) contains the Instruction and Question Papers on Stair Building, Ornamental Ironwork, Roofing, Sheet-Metal Work, and Electric-Light Wiring and Bellwork; Vol. IV (16-19) contains the Instruction and Question Paper on Plumbing and Gas-Fitting, Heating and Ventilation, Painting and Decorating, and Estimating and Calculating Quantities; Vol V. (20-25) contains the Instruction and Question Papers on History of Architecture, Architectural Design, Specifications, Building Superintendence, and Contracts and Permits; Vol. VI contains the Drawing Plates and the instructions for drawing them...; Vol. VII contains the tables and formulas given in the various Instruction Papers...; Vol. VIII contains the answers to the questions and solutions to the examples in the Question Papers" (iv-v).

⁶ Albert Kelsey, "The International Correspondence School - Department of Architecture," *The Architectural Annual* 1 (1900): 266.

⁷ On immigration to the United States in the Gilded Age, see John Higham, *Strangers in the Land: Patterns of American Nativism, 1860-1925*, Revised Edition (New Brunswick, N.J: Rutgers University Press, 2002); John Bodnar, *The Transplanted: A History of Immigrants in Urban America*, Edition Unstated (Bloomington: Indiana University Press, 1987). On the construction of "whiteness" in this period, see Matthew Frye Jacobson, *Whiteness of a Different Color: European Immigrants and the Alchemy of Race* (Cambridge, Mass.: Harvard University Press, 1999).

⁸ Jürgen Kocka, *White collar workers in America, 1890-1940: a social-political history in international perspective* (London; Beverly Hills: Sage Publications, 1980), 114. For an account of when white-collar professionals in architecture joined in solidarity with blue-collar workers during the 1930s, see Mardges Bacon, "The Federation of Architects, Engineers, Chemists and Technicians (FAECT): The Politics and Social Practice of Labor," *Journal of the Society of Architectural Historians* 76, no. 4 (December 1, 2017): 454–63. See also Stuart M. Blumin, *The Emergence of the Middle Class: Social Experience in the American City, 1760-1900*, Interdisciplinary Perspectives on Modern History (Cambridge [England]; New York: Cambridge University Press, 1989).

⁹ I have been unable to locate this advertisement in *Wilshire's Magazine* but it was included in a collection of images provided to me by archivists at the Scranton University Archives. It has been annotated "Wilshire's Magazine, March."

¹⁰ Edwin Gabler, *The American Telegrapher: A Social History, 1860-1900* (New Brunswick, N.J: Rutgers University Press, 1988).

¹¹ Although I am skeptical that the photograph is really of John Tibbets, there was an architecture firm in West Virginia called Lyons & Tibbetts. See "Architectural Drawings by A.C. Lyons in Fairmont, West Virginia," A&M 3248, West Virginia and Regional history Center, West Virginia Libraries, accessed June 27, 2019, <https://archives.lib.wvu.edu/repositories/2/resources/1547>.

¹² "Carpenter Becomes Architect," *The National Builder* 33 (February 1903): 7.

¹³ "Are You Held Down," *The National Builder* 33 (November 1903): 7.

¹⁴ "Are You a Cog?," *The National Builder* 34 (October 1903): 7.

¹⁵ "Better than Money, Architecture Taught By Mail," *Architects' and Builders' Magazine* 1, no. 3 (December 1899): 29.

¹⁶ Thorstein Veblen, *The Higher Learning in America: The Annotated Edition: A Memorandum on the Conduct of Universities by Business Men*, ed. Richard F. Teichgraeber III, Annotated edition (Baltimore: Johns Hopkins University Press, 2015). On the differences between Low and Butler, civic and academic culture, see Thomas Bender, *New York Intellect*, 1st edition (New York: Knopf, 1987), 263–93.

¹⁷ Michael Rosenthal, *Nicholas Miraculous: The Amazing Career of the Redoubtable Dr. Nicholas Murray Butler*, First edition (New York: Farrar, Straus and Giroux, 2006), 8.

¹⁸ On Butler's career in general, see Rosenthal, *Nicholas Miraculous*. On Butler and academic freedom, see Michael M. Sokal, "James McKeen Cattell, Nicholas Murray Butler, and Academic Freedom at Columbia University, 1902–1923," *History of Psychology* 12, no. 2 (May 2009): 87–122.

¹⁹ A. D. F. Hamlin, "For a Columbia School of Art," *Columbia University Quarterly* 3, no. 4 (September 1901): 367.

²⁰ Julie Reuben provides an account of the founding of Columbia's fine arts department in 1921. "Increased interest in the humanities also brought in outside funding for the arts. At Columbia, for example, the department of fine arts floundered for several decades without adequate support. It was finally given a stable foundation when merchant and art connoisseur Hugo Reisinger gave Columbia \$100,000 to establish a professorship of the history of art. As a result of this gift, S. Butler Murray was hired as an assistant professor in 1921. Murray steadily built a strong undergraduate and graduate program in the history of art. In 1925 the Carnegie Corporation began to give money to promote leadership in the arts. It awarded fellowships to prospective college arts teachers and grants to universities to improve their art instruction. Under this program, Yale, which had approved a bachelor of arts in fine arts in 1919-20, received \$150,000 to establish a professorship in the history of art. Frederick P. Keppel, the president of Carnegie who had initiated the support for the arts, praised art instruction as a way to reach 'those students to whom the dominant appeal is through the sensibilities and emotions rather than through the intellect' and 'to enrich and inspire college life and to continue its influence thereafter.' Keppel brought from Columbia, where he had been dean of the college, to Carnegie a belief in the power of the arts to uplift individuals and society. In 1925 Keppel could report that college courses in art had grown from practically 'zero' a decade earlier to a respectable, if not yet satisfactory, amount. The enlarged art programs were part of the growing importance of the humanities in the undergraduate curriculum." *The Making of the Modern University: Intellectual Transformation and the Marginalization of Morality*, 1 edition (Chicago: University of Chicago Press, 1996), 228.

²¹ On growing American interest in artists and the fine arts in this period, see Sarah Burns, *Inventing the Modern Artist: Art and Culture in Gilded Age America* (New Haven: Yale University Press, 1999).

²² For primary documents concerning Columbia's School of Fine Arts, see "School of the Arts Records, 1895-1997," n.d., UA#0100, University Archives, Columbia University. Rosenthal recounts the School of Fine Arts episode in Rosenthal, *Nicholas Miraculous*, 153–55.

²³ Nicholas Murray Butler, "The Place of Art in Civilization," in *The Promise of American Architecture; Addresses at Teh Annual Dinner of the American Institute of Architects*, ed. Charles Moore (Washington: American Institute of Architects, 1905), 21.

²⁴ Committee on Education, ed., *The Significance of the Fine Arts*, American Institute of Architects (Boston, Massachusetts: Marshall Jones Company, 1923).

²⁵ Mary N. Woods, "Charles Follen McKim and the Foundation of the American Academy in Rome," in *Light on the Eternal City: Observations and Discoveries in the Art and Architecture of Rome*, ed. Hellmut

Hager and Susan C. Scott, *Papers in Art History from the Pennsylvania State University*, v. 2 (University Park: Pennsylvania State University, 1987), 312. On the history of the American Academy in Rome, see Fikret K. Yegül, *Gentlemen of Instinct and Breeding: Architecture at the American Academy in Rome, 1894-1940* (New York: Oxford University Press, 1991); Lucia N. Valentine and Alan Chester Valentine, *The American Academy in Rome, 1894-1969* (Charlottesville: University Press of Virginia, 1973).

²⁶ Kurt G.F. Helfrich, "'Beloved Ancient': William T. Partridge's Recollections of the Senate Park Commission and the Subsequent Mall Development," in *Designing the Nation's Capital*, ed. Sue Kohler and Pamela Scott (Washington, D.C.: U.S. Commission of Fine Arts, 2007).

²⁷ William T. Partridge, "William R. Ware; Reminiscences of Resignation," Undated, Box 2:5, Ware Collection, Avery Architectural Archives, Columbia University. Butler knew of Ware's involvement with I.C.S. prior to Ware's presentation to the Board of Trustees. A letter from Ware to Butler dated October 22, 1902 mentions the I.C.S. See Nicholas Murray Butler papers 1891-1947, Series II, Box 442, Archival Collections, Columbia University.

²⁸ See Zeynep Çelik Alexander, *Kinaesthetic Knowing: Aesthetics, Epistemology, Modern Design*, First Edition (Chicago; London: University of Chicago Press, 2017). Alexander's analysis focuses mostly on architectural education in Germany and at the Bauhaus.

²⁹ See Sean Keller, *Automatic Architecture: Motivating Form after Modernism*, First Edition (Chicago: University of Chicago Press, 2018).

³⁰ Tim Love, "Between Mission Statement and Parametric Model: A Crisis in Architectural Education Is Brewing," *Places Journal*, September 2009, <https://placesjournal.org/article/between-mission-statement-and-parametric-model/>.

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The Ware Course: Architecture as a Useful, Liberal, and Fine Art

Visual Appendix

Introduction:

Architecture and Expertise



Figure 1. William Robert Ware circa 1865. M.I.T. Special Collections.

Part I | Architecture as a Useful Art

Visual Appendix

Introduction:
The 1870 Drawing Act



Figure 2. Walter Smith. From Green (1966).

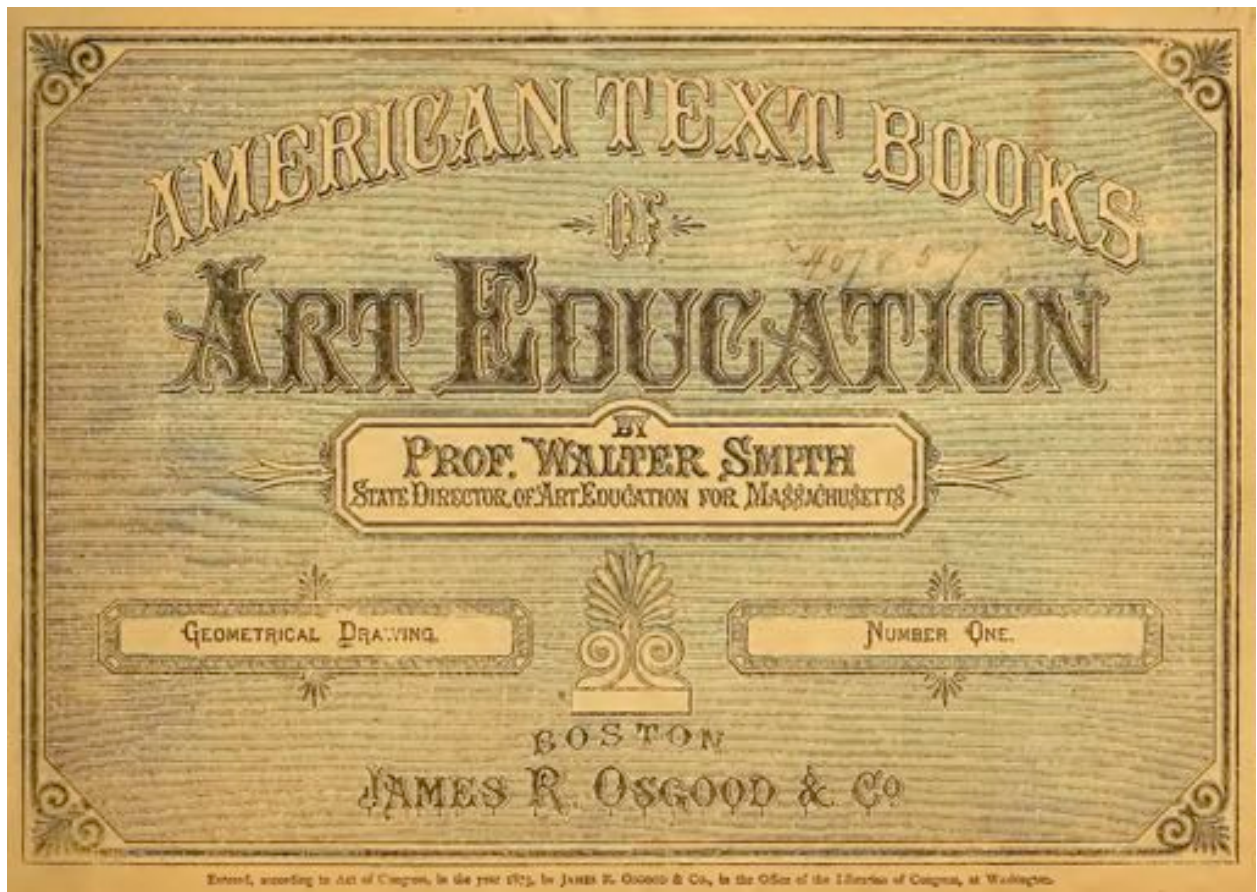


Figure 3. Cover-page to Walter Smith's *American Text Books of Art Education* (1873).

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PRISMS.—No. 9, Cylinder; 10, Triangular Prism; 11, Rectangular Prism, or Oblique Block (Parallelepiped); 12, Hexagonal Prism.

PYRAMIDS.—No. 13, Cone; 14, Triangular Pyramid; 15, Rectangular or Right Pyramid; 16, Hexagonal Pyramid.

OTHER SOLIDS.—No. 17, Sphere; 18, Frustum of a Cone; 19, Cube; 20, Flight of four steps.

FRAMES.—No. 21, Circular Frame; 22, Triangular Frame; 23, Square Frame; 24, Hexagonal Frame.

VARIOUS SOLIDS.—No. 25, Cone; 26, Double Cone; 27, Skeleton Cube; 28, Skeleton Hexagonal Block.

DEFINITIONS.

Plane.—A plane has length and breadth, but no thickness. The line which divides the diameter of the plane; that is, a circular plane, or a hexagonal plane. Unless otherwise stated, the name hexagonal, triangular, &c., refers to regular forms; i.e., to hexagons, triangles, &c., having equal sides and angles.

Plate.—A plate is a construction of a plane. If the length of the axis of a plane be shorter than its diameter, it is commonly, by disengagement, described as a plate. It is simply a slice cut from the end of a prism.

Prism.—A prism is a geometrical solid having two base (ends) or faces which are equal and parallel, and whose sides are parallel planes.

It is a right prism when the base and sides are perpendicular to each other, and an oblique prism when the planes of the base and sides are not right angles. A line from corner or centre of each base is called the axis of the prism.

Pyramid.—A pyramid is a geometrical solid having a regular polygon, square, or triangle as its base, and its sides composed of triangles having a common vertex. A right pyramid has its axis and base perpendicular to each other.

A Sphere is a solid bounded by a curved surface, every point in which is equally distant from a point within it, called the centre. It is described by the revolution of a semi-circle on its diameter.

A Frustum of a Cone is that part of the solid which is cut off by a plane parallel to the base.

A Cube is a rectangular parallelepiped, whose six faces are all square planes.

A Flight of Steps (or a geometrical solid) is composed of two planes, vertical and horizontal; the first being called the riser, and the second the tread.

Frame.—A Frame, unless otherwise specified, is a regular pentagonal shape composed of planes, square in the outline perpendicular to their axis.

The Circular Frame is an exception to this, though a section made by a radius of its base will be square also.

Various Solids.

A Cone is the intersection of two or more similar planes.

A Double Cone is the junction of two cones having a common vertical axis.

A Skeleton Cube is composed of right prisms, square in section, and made into the form of a cube.

A Skeleton Hexagonal Block is composed of right prisms, square in section, made into the form of a parallelepiped.

Figure 4. Learning to draw models, from Smith's *American Text Books of Art Education* (1873).

Part I | Architecture as a Useful Art

Visual Appendix

Chapter One:

Professional Self-Fashioning: Building Credibility, Becoming Expert

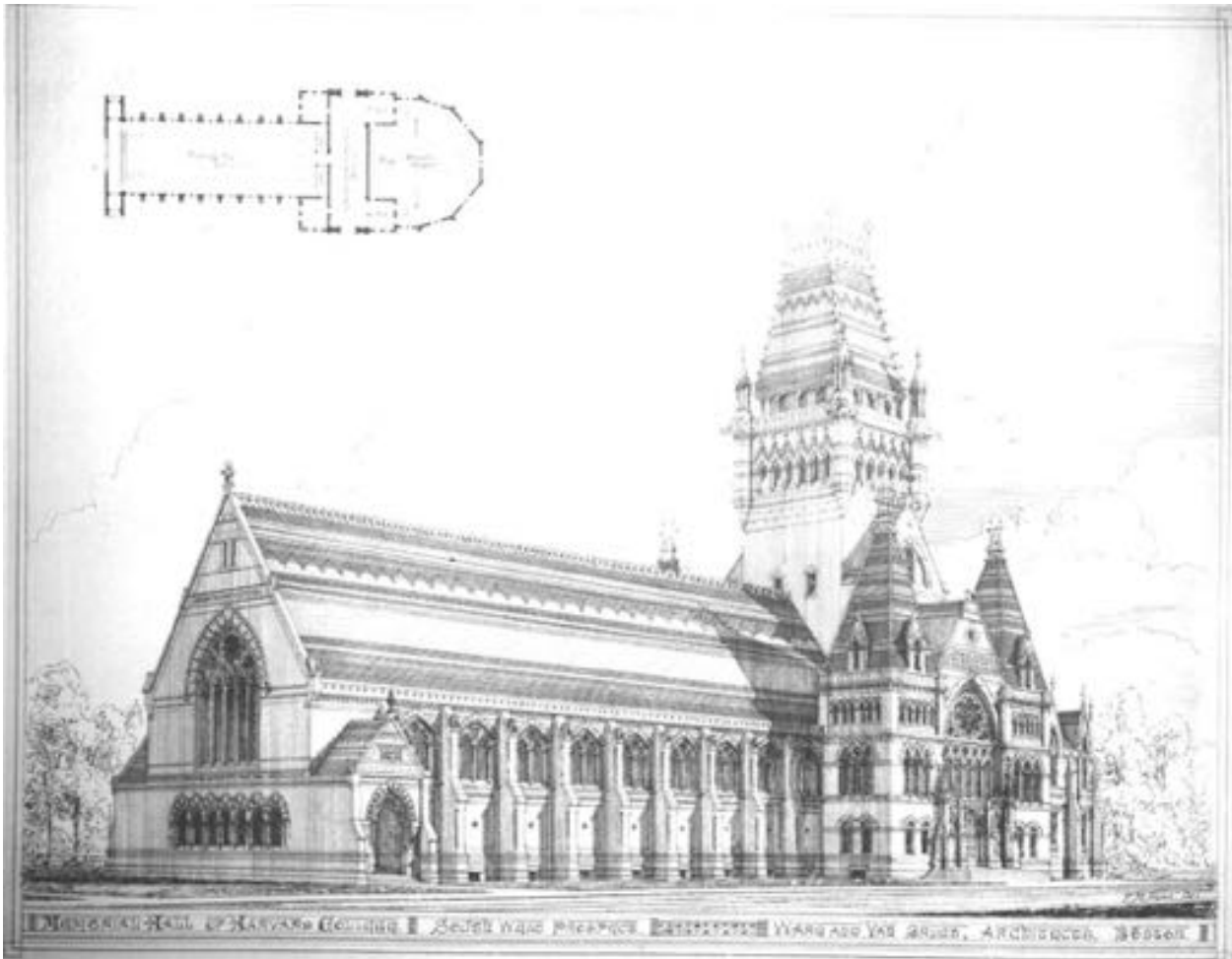


Figure 5. Ware's first large project: Harvard's Memorial Hall, final exterior perspective. The building would not be completed until the late 1870s. Courtesy of Harvard University Archives (Collection #166).

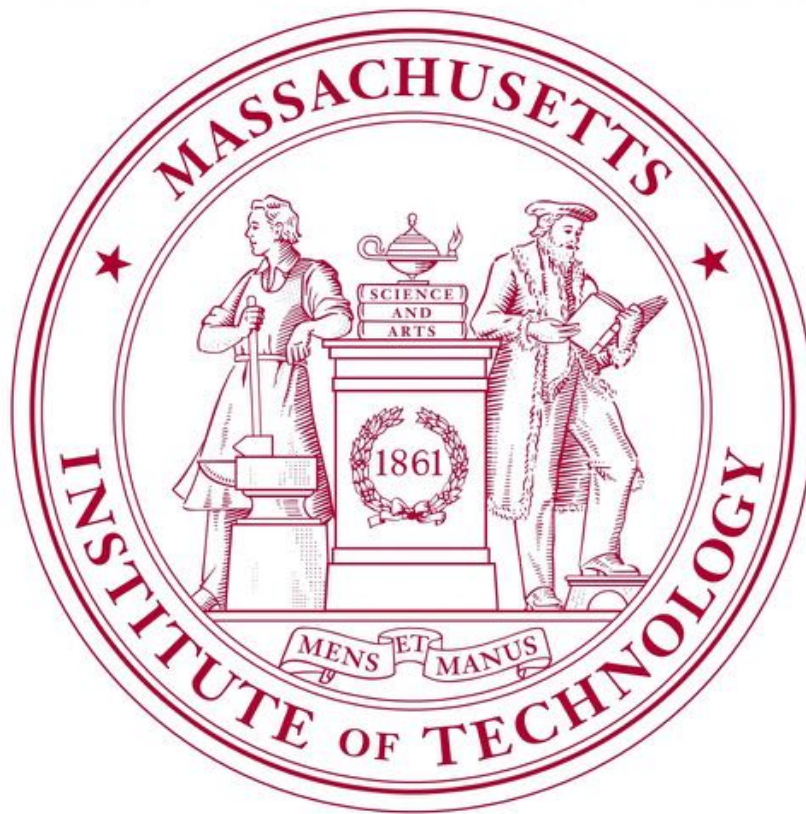


Figure 6. The original seal for the Massachusetts Institute of Technology. Courtesy of MIT Institute Archives and Special Collections.
<https://libraries.mit.edu/mithistory/institute/seal-of-the-massachusetts-institute-of-technology/>



Figure 7. Rogers Building (1866), Massachusetts Institute of Technology. Courtesy of MIT Institute Archives and Special Collections.



Figure 8. Freshman drawing room, Rogers Building, Massachusetts Institute of Technology. Courtesy of MIT Institute Archives and Special Collections.

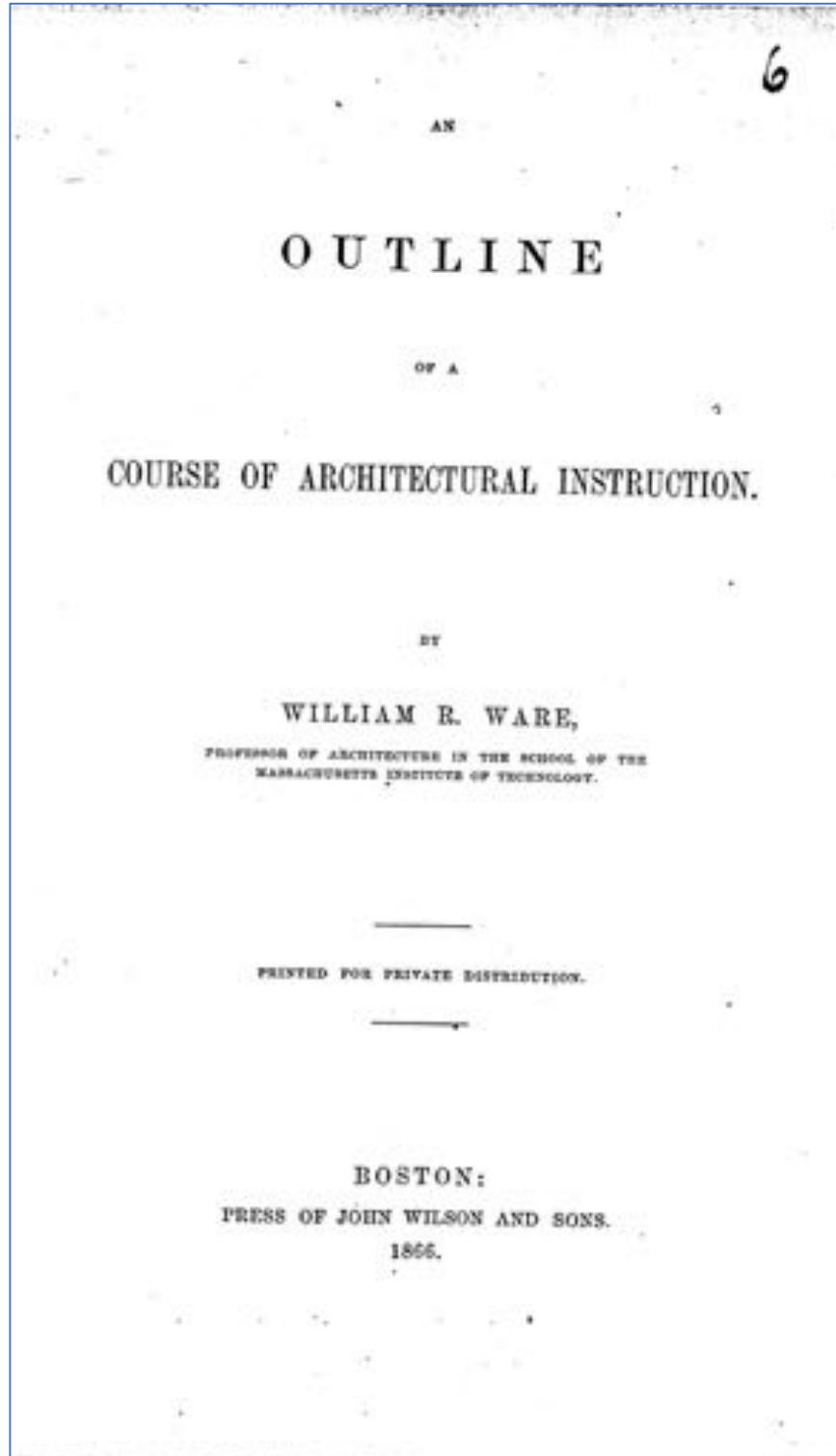


Figure 9. Cover-page to Ware's *Outline* (1866).

Part I | Architecture as a Useful Art

Visual Appendix

Chapter Two:
After Apprenticeship: Drawing and the Need for Skill in the 1870s

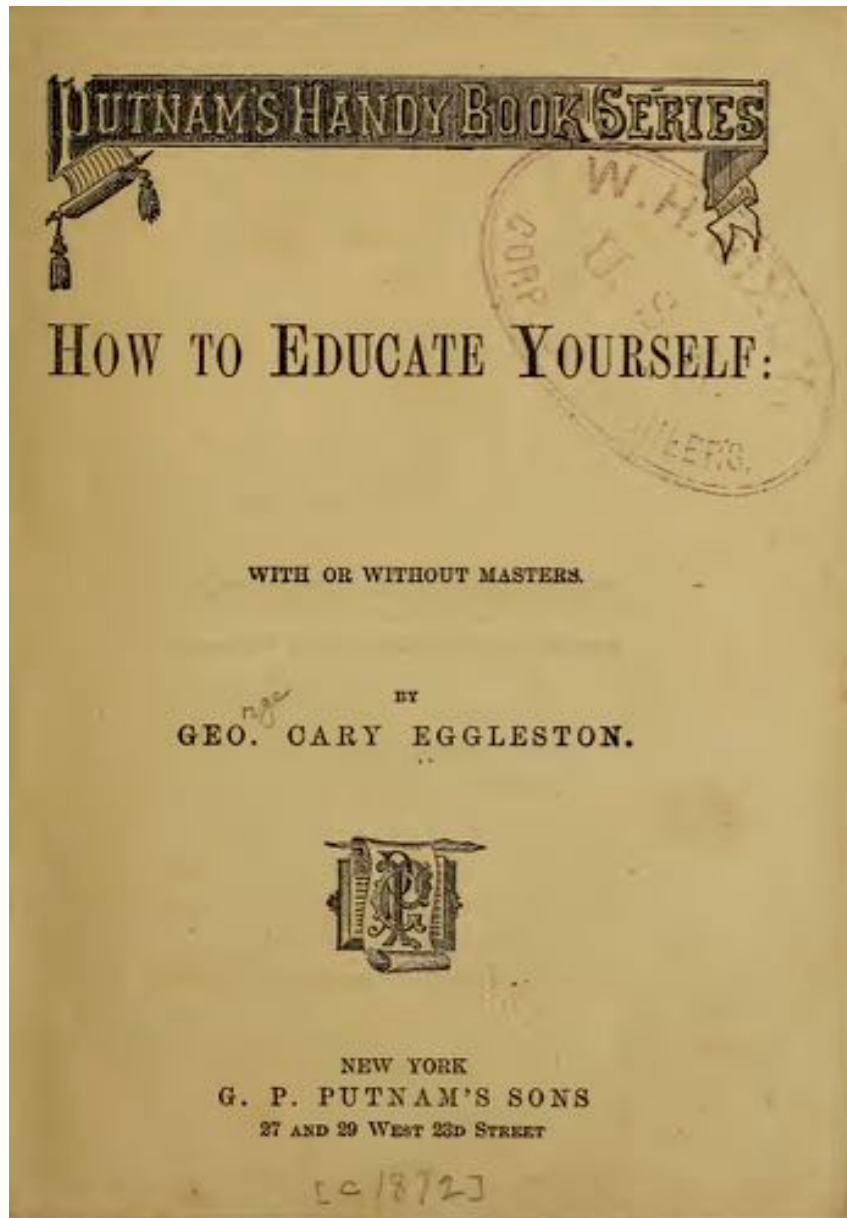


Figure 10. The cover-page of Eggleston's *How to Educate Yourself: With or Without Masters* (1872).

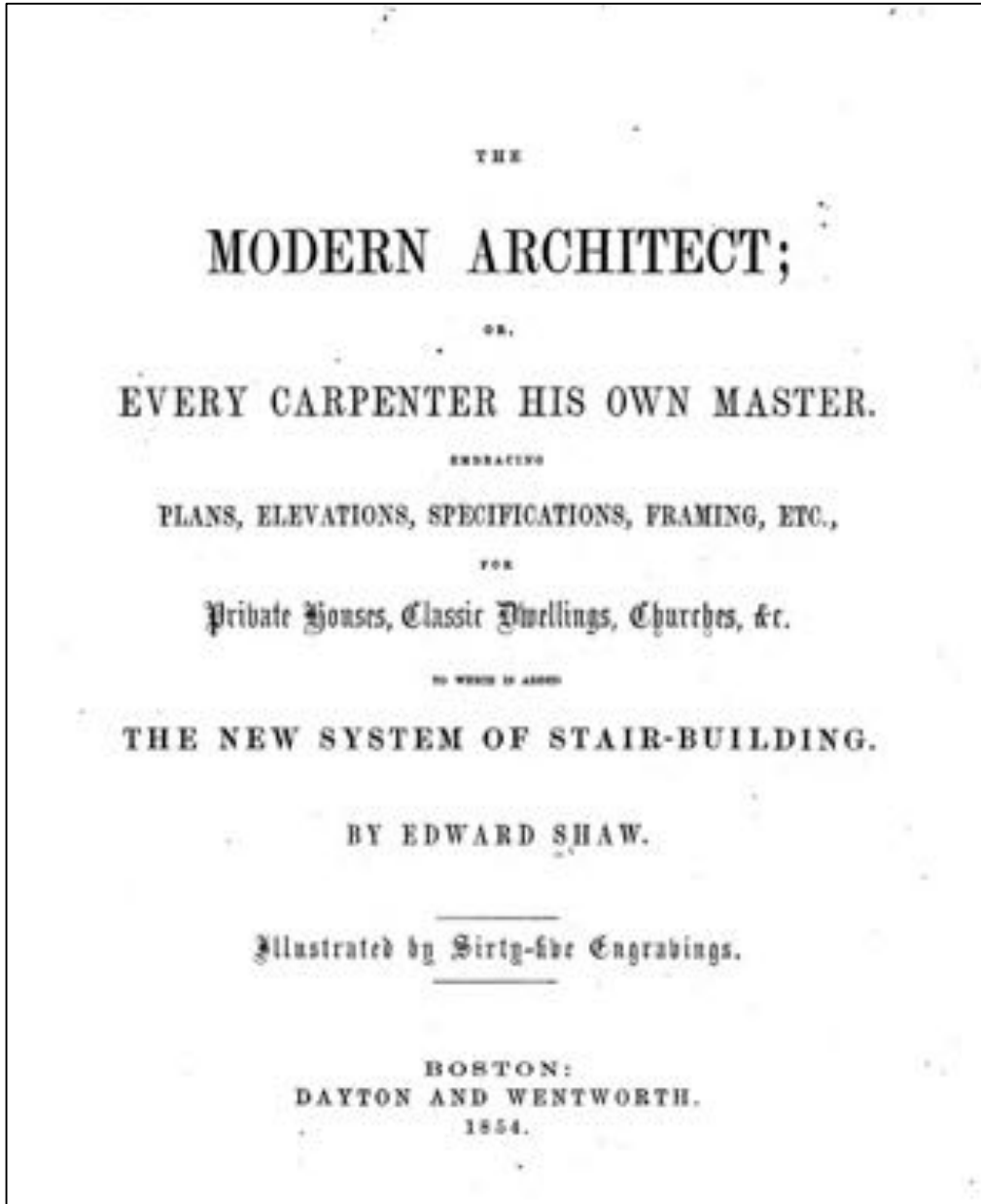


Figure 11. The cover-page of Edward Shaw's *The Modern Architect; or, Every Carpenter His Own Master* (1854).

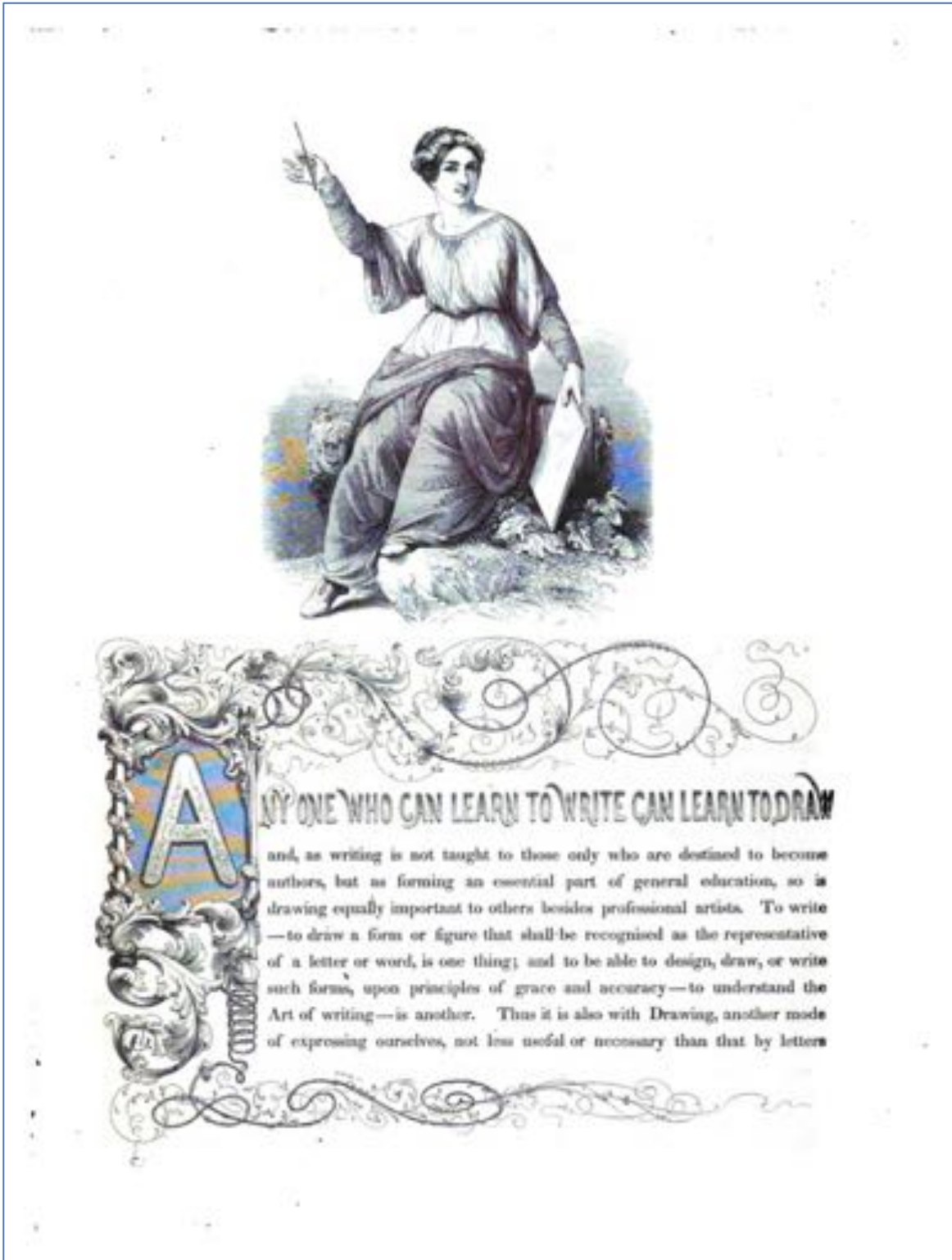


Figure 12. Cover-page of J.G. Chapman's *The American Drawing-Book* (1847), a key text of the Art Crusade.

Figure 13. Walter Smith's *Art Education, Scholastic and Industrial* (1873).

Part II | Architecture as a Liberal Art

Visual Appendix

Introduction:
Ware's Move to Columbia

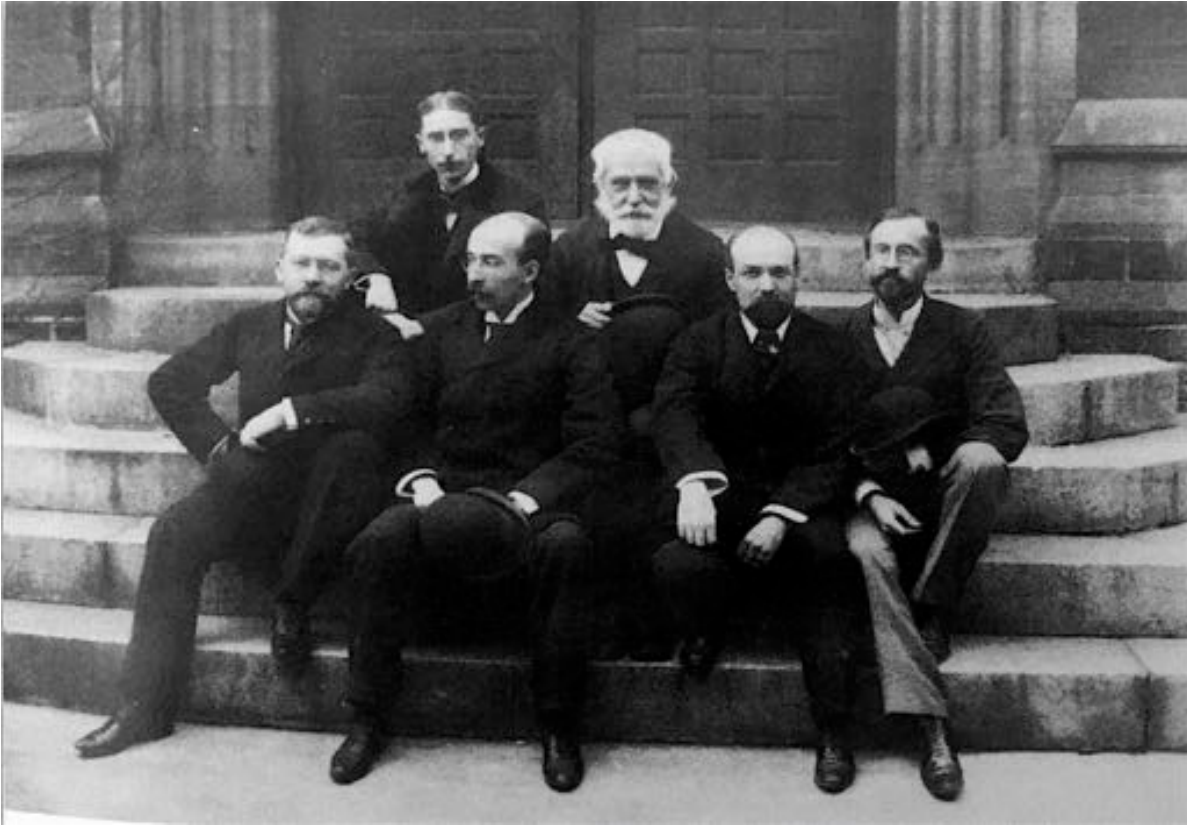


Figure 13. William Ware and the architecture faculty at Columbia's School of Mines. Avery Archives, Columbia University.



Figure 14. Sarah Goodridge. *Reverend Henry Ware, Jr.* Approx. 1828. Watercolor on ivory. 9.2 x 7.3 cm (3 5/8 x 2 7/8 in.). Museum of Fine Arts, Boston.

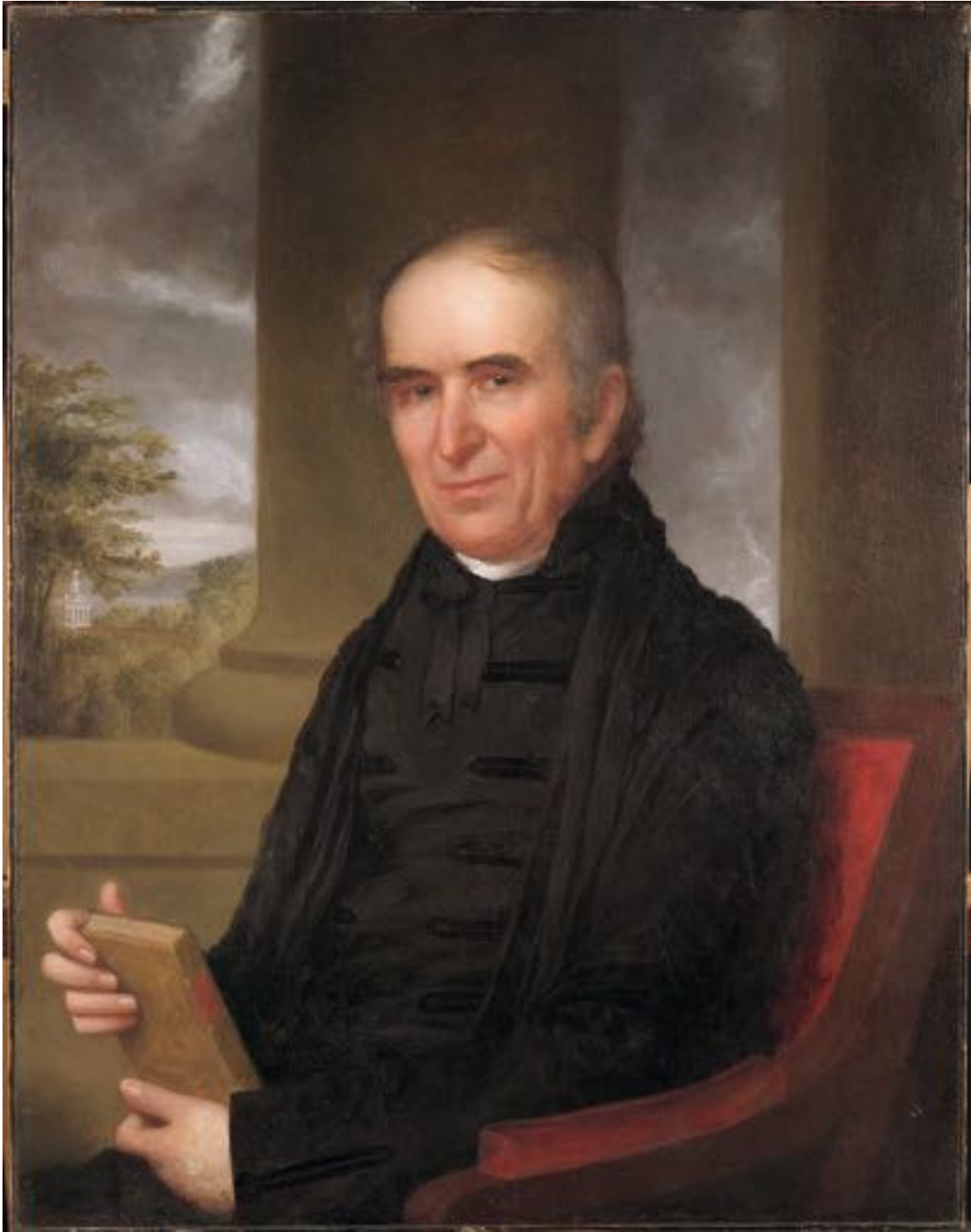


Figure 15. Charles Osgood. *Henry Ware Sr.* 1835. Oil on canvas. 91.9 x 71.7 cm (36 3/16 x 28 1/4 in.). Harvard University Portrait Collection, Harvard Art Museum.

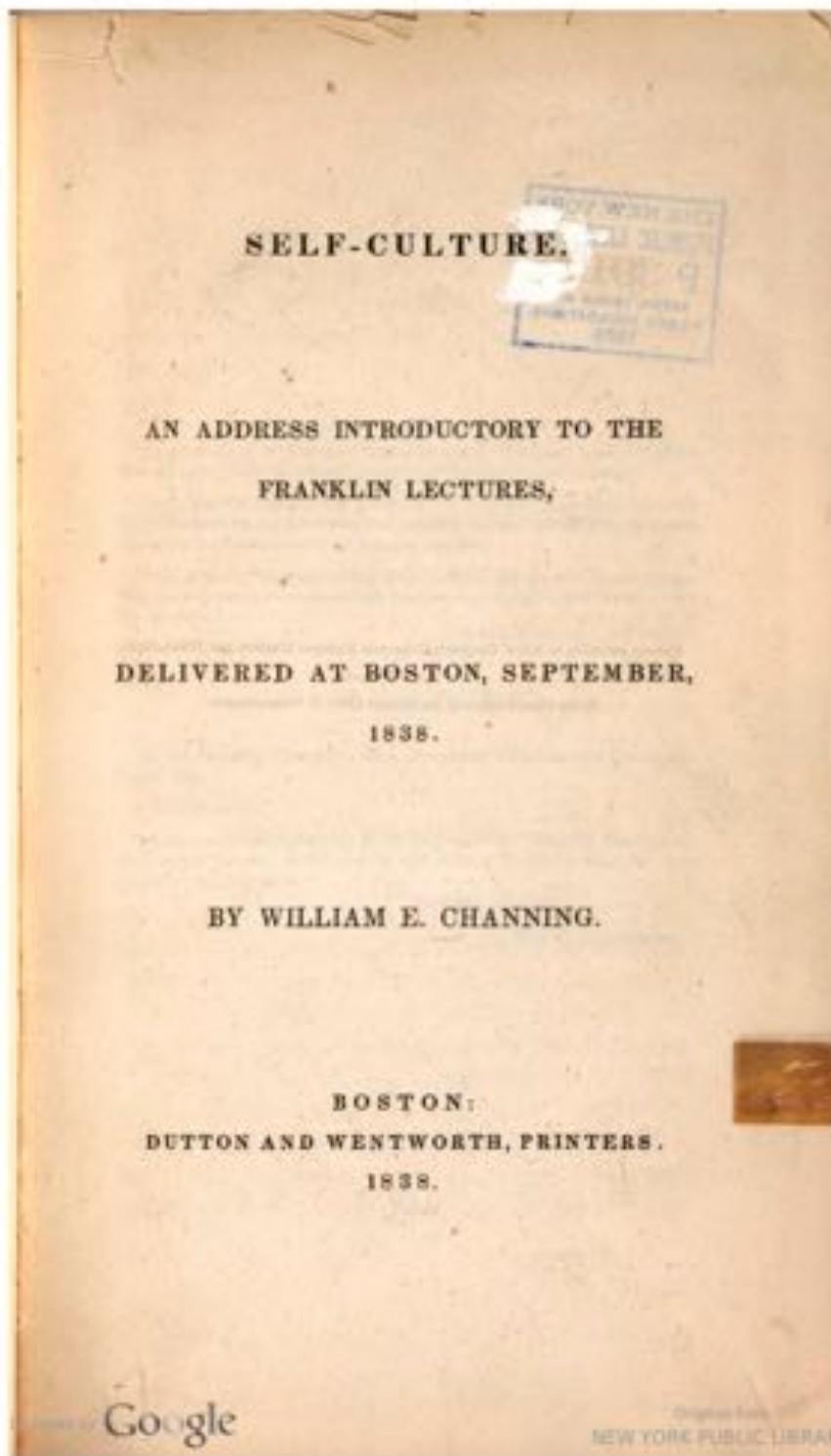
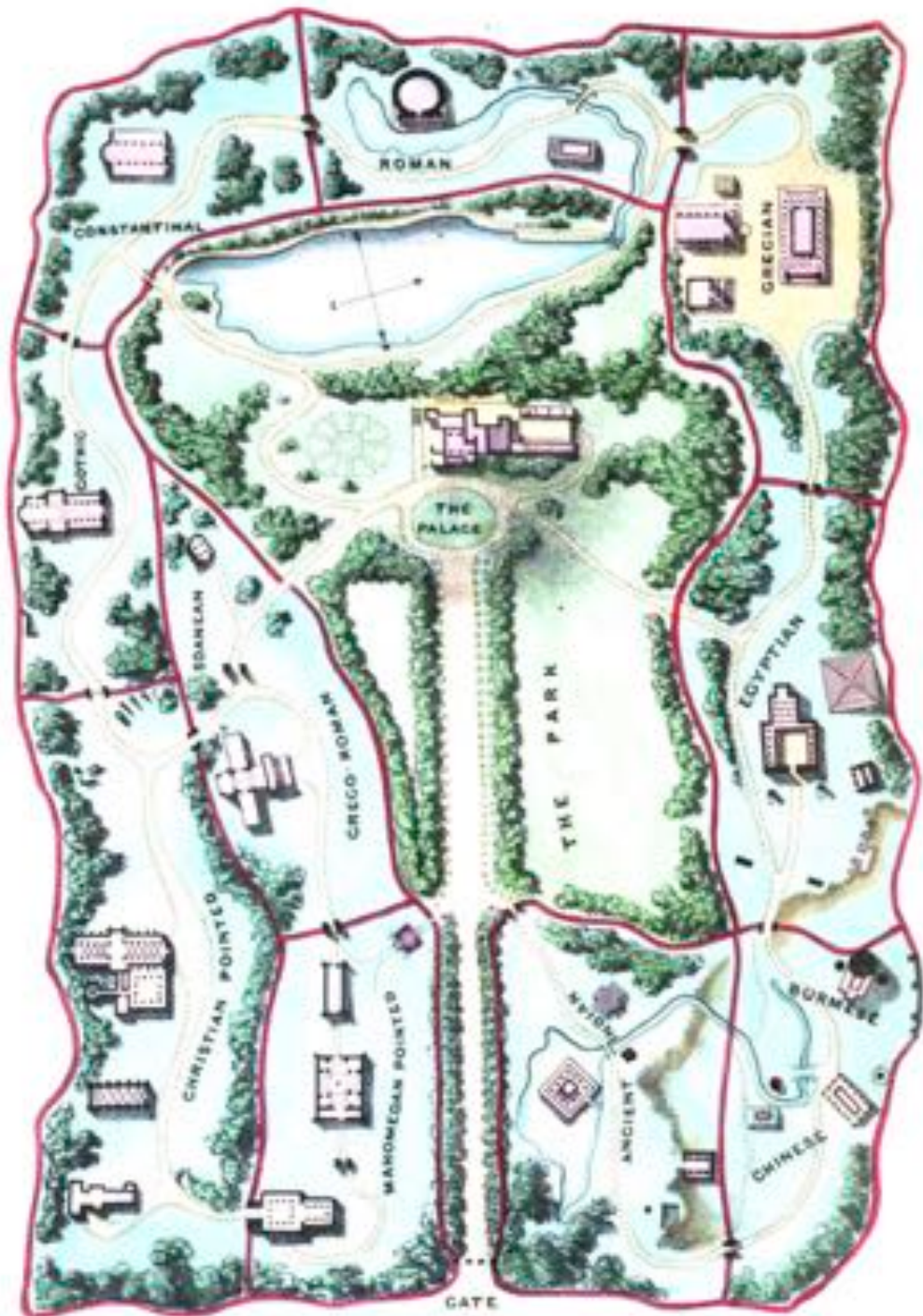


Figure 16. Title page to William Ellery Channing's *Self-Culture* (1838).



Map by G. S. J. Whitwick & Co. Ltd.

**PALACE OF ARCHITECTURE.
MAP OF THE DOMAIN.**

Figure 17. A site plan from George Whitwick's *The Palace of Architecture* (1840).



Figure 18. Thomas Cole. *The Architect's Dream*. 1840. Oil on canvas. 53 x 84 1/16 in. x 84 1/16 in. Florence Scott Libbey Bequest, Toledo Museum of Art.



Figure 19. C.R. Cockerell. *The Professor's Dream*. 1848. Drawing in pencil, pen & gray ink and watercolour, with scratched highlights. 1122 mm x 1711 mm. Royal Academy of Arts. The drawing is a comparative chart of architectural monuments.

Part II | Architecture as a Liberal Art

VISUAL APPENDIX

Chapter Three:

Architecture in the Age of University Reform:
Professionalism, Classicism, and the Study of Architectural History



Figure 20. The Engineering Experiment Station at the University of Illinois. “The College of Engineering and Engineering Experiment Station of the University of Illinois: A Pictorial Description,” *University of Illinois Bulletin* XVI, no. 19 (January 6, 1919).

VIEWS of one end of the laboratory showing several universal testing machines used for determining the strength in tension, compression, or bending of bending materials such as iron, steel, timber, brick, or concrete.



MATERIALS TESTING LABORATORY



A STEEL beam from a railroad bridge is being tested in bending. The testing machine is a huge screw-power press fitted with a massive platform scale for weighing the load applied. The screws which exert pressure can be seen in the cut. Load is applied and weighed until the beam collapses, and the deflection is measured by means of a micrometer dial shown at the middle of the beam.

TEST OF A LARGE STEEL BEAM

THE beam is being tested in cross-bending. Delicate micrometers are used to measure the stretch along the under side and the compression along the upper side.



TEST OF A REINFORCED CONCRETE BEAM

MATERIALS TESTING LABORATORY

Figure 21. "Materials Testing Laboratory." The Engineering Experiment Station at the University of Illinois. "The College of Engineering and Engineering Experiment Station of the University of Illinois: A Pictorial Description," *University of Illinois Bulletin* XVI, no. 19 (January 6, 1919).



REINFORCED CONCRETE COLUMN
 View showing a concrete column with vertical steel rods after failure. The top of the column is covered with an iron plate imbedded in plaster of Paris to insure an even bearing. A load of 400,000 pounds produced failure.



TEST OF A CONCRETE COLUMN
 The column is 12 inches in diameter and 20 feet long, reinforced with spiral steel wire hooping. Its top is not visible. The testing machine has a capacity of 600,000 pounds and can be used for testing in either tension or compression.



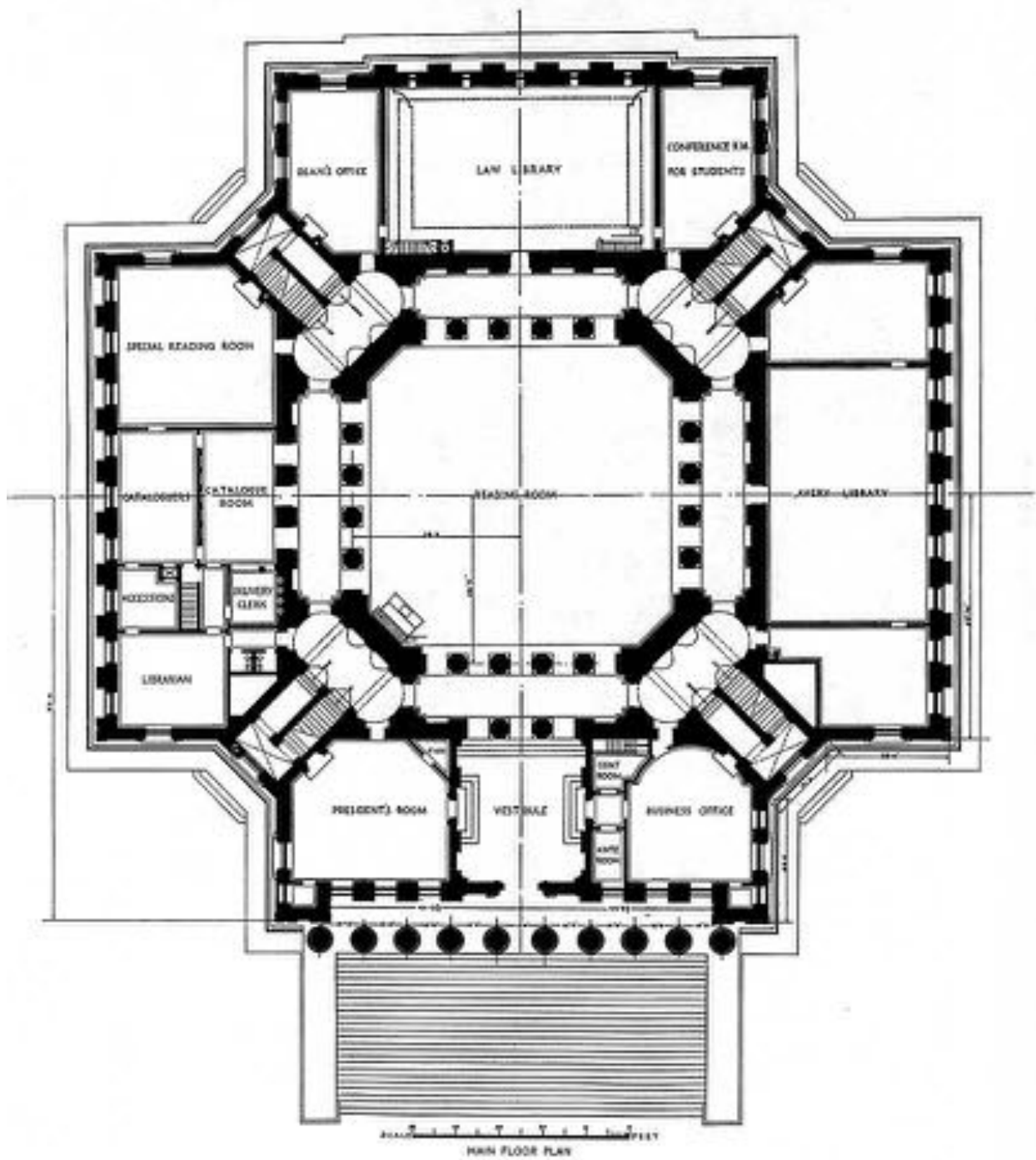
TEST OF A STEEL COLUMN
 Failure of a built-up steel column made from angles and plates. This type of column is usually imbedded in concrete to give stiffness, and also for fire-proofing purposes.



TEST OF BOND BETWEEN CONCRETE AND STEEL
 The bond is determined by measuring the force and the slip as the steel rod is pulled out of the concrete.

MATERIALS TESTING LABORATORY

Figure 22. "Materials Testing Laboratory" (cont.). The Engineering Experiment Station at the University of Illinois. "The College of Engineering and Engineering Experiment Station of the University of Illinois: A Pictorial Description," *University of Illinois Bulletin* XVI, no. 19 (January 6, 1919).



COLUMBIA UNIVERSITY LIBRARY, NEW YORK CITY.
1893

Figure 23. A plan of Low Library, including the Law Library and the Avery Library. University Archives, Columbia University.

The Architectural Review.

Vol. II., No. 3.

April 3, 1893.

The Use and Abuse of Precedent.

SECOND ARTICLE.

In a previous article, in considering the use that has been made of precedent, examples were cited in which a whole design or its main motive has been borrowed with but unimportant modifications, and in buildings intended to meet wants very different from those of the original structures, the fact being that men do not do their original designs never dream of. It is so far as the case of the modern building and its prototype differ, and in so far as the original designer was successful in producing a design that was fitting and expressive, it is obvious that the borrowed form must be to that extent inappropriate and unexpressive in its new place. Its use is, therefore, to be regarded as including false standards of taste, however ready one may be to admit that it is better to borrow a good design than originate a bad one. If the case were one in which the new building was identical with its prototype, or nearly so, in use and position, the borrowing might be justifiable, but as a matter of fact, such cases rarely, if ever, occur. Except possibly, with some of the simplest buildings, conditions never precisely repeat themselves.

The case is somewhat different with regard to the separate features of buildings. The more or less close copying of such single features, if judiciously done, may be justifiable, since their purpose is apt to be constant. Now it is an entirely easy thing thus to use a single feature from a much-admired building and make it harmonize perfectly with its new surroundings. To do it successfully requires a thorough knowledge of the style, complete familiarity with its conditions, and a sensitive feeling for harmony. Without these qualifications on the part of the designer, the borrowed feature is sure to look like a patch. In such a case complete success is the sufficient and only justification, and it will generally be found that, where complete success has been obtained, the borrowed feature has been subject to some modification more or less marked.



GREAT TOWER, BRISTOL.



RAILWAY POLICE LINE TOWER.

Figure 24. Warren's "The Use and Abuse of Precedent" (1893) in the *Technology Architectural Review*.



Figure 25. Stanford White's New York Herald Building (1895). From Warren (1893).



Figure 26. The Palazzo del Consiglio in Verona, Italy (1476). From Warren (1893).



Figure 27. The American Fine Arts Society in New York City (1892). From Warren (1893).

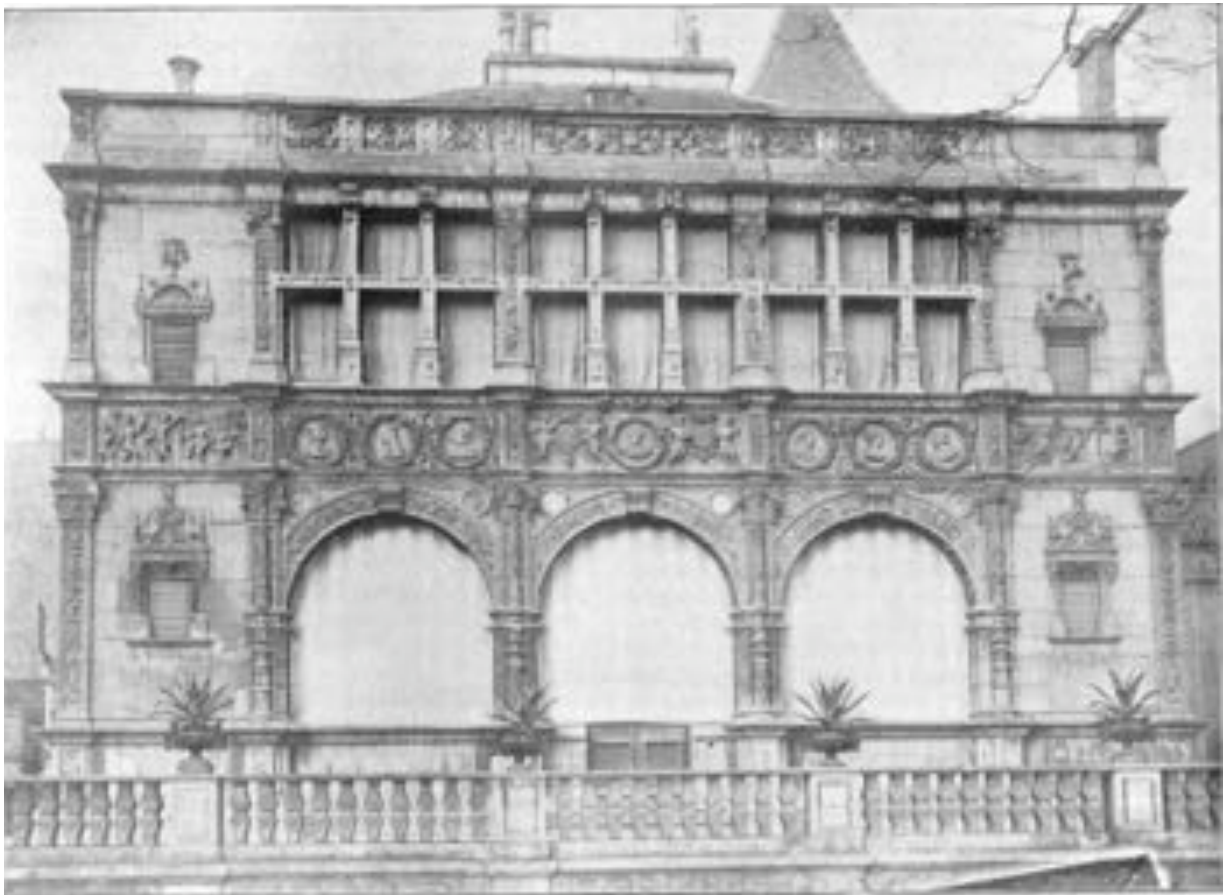


Figure 28. King Francis I's Hunting Lodge in Paris (16th century). From Warren (1893).

THE AMERICAN VIGNOLA

The Five Orders

INTRODUCTION

A BUILDING is a shelter from rain, sun and wind. This implies a *Roof*, and *Walls* to support it. If the walls entirely enclose the space within, there are *Doorways* for access, and *Windows* for light. Roofs and walls, doors and windows are the essential features of buildings.

Roofs may be flat, sloping or curved. A roof with one slope is called a *Lean-to* (1). When two sloping roofs rest upon parallel walls and lean against one another, they meet in a horizontal *Ridge* (2) at the top, and form a *Gable* at each end. Roofs that rise from the same wall in opposite directions form a *Horizontal Valley* (3) at the wall. If the walls make a projecting angle, the roofs intersect in an inclined line called a *Ridge* (4). If the walls meet in a re-entering angle, the inclined line of intersection is called a *Valley*. Circular walls carry conical (5) or domical roofs (5').

If there is more than one story, the flat roof of the lower story becomes the *Floor* of the story above. If the roof extends beyond the wall that supports it, the projection is called the *Eaves* (6). If the wall also projects, to support the extension of the roof, the projection is called a *Corice* (7). The principal member of a cornice, which projects like a shell, is called a *Crona* (8).

Walls are generally made wider just at the bottom, so as to get a better bearing on the ground. This projection is the *Base* (9). A similar projection at the top is called a *Cap*, or, if it projects much, a *Corice*, as has been said. A low wall is called a *Parapet*. A short piece of wall about as long as it is thick is called a *Post*, and if it supports something, a *Probst* (10), and the part between its *Cap* and *Base* is then the *Shaft*. A tall post is called a *Pier* (11) if it is square, and a *Column* if it is round. Caps of piers and columns are called *Capitals*, and the part between the *Cap* and the *Base*, the *Shaft*. The flat upper member of a *Capital* is called the *Abacus*.

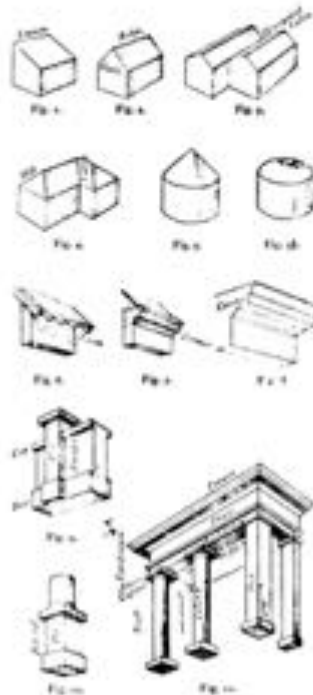


Figure 29. Ware's *The American Vignola* (1902).

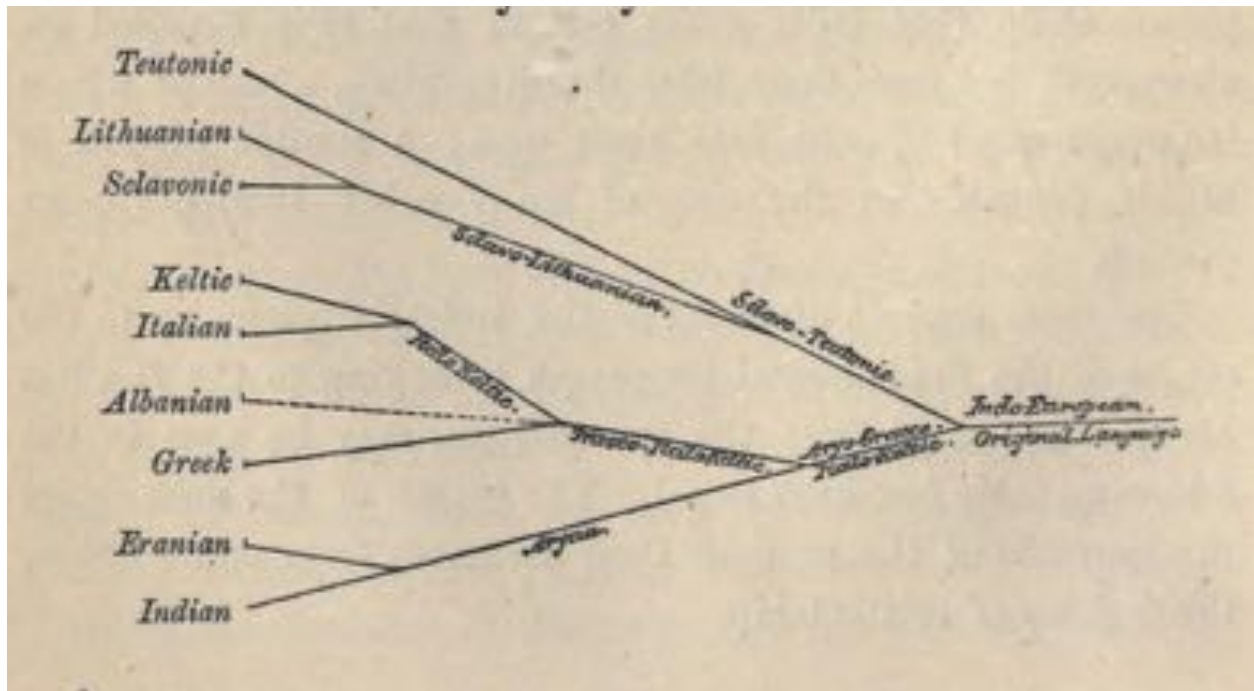


Figure 30. Schleicher's *Stammbaumtheorie*, or "family tree" model of the Indo-European languages. Originally published in his *Deutsche Sprache*, "German Language" (1860).
Reproduced from Alter (2003).

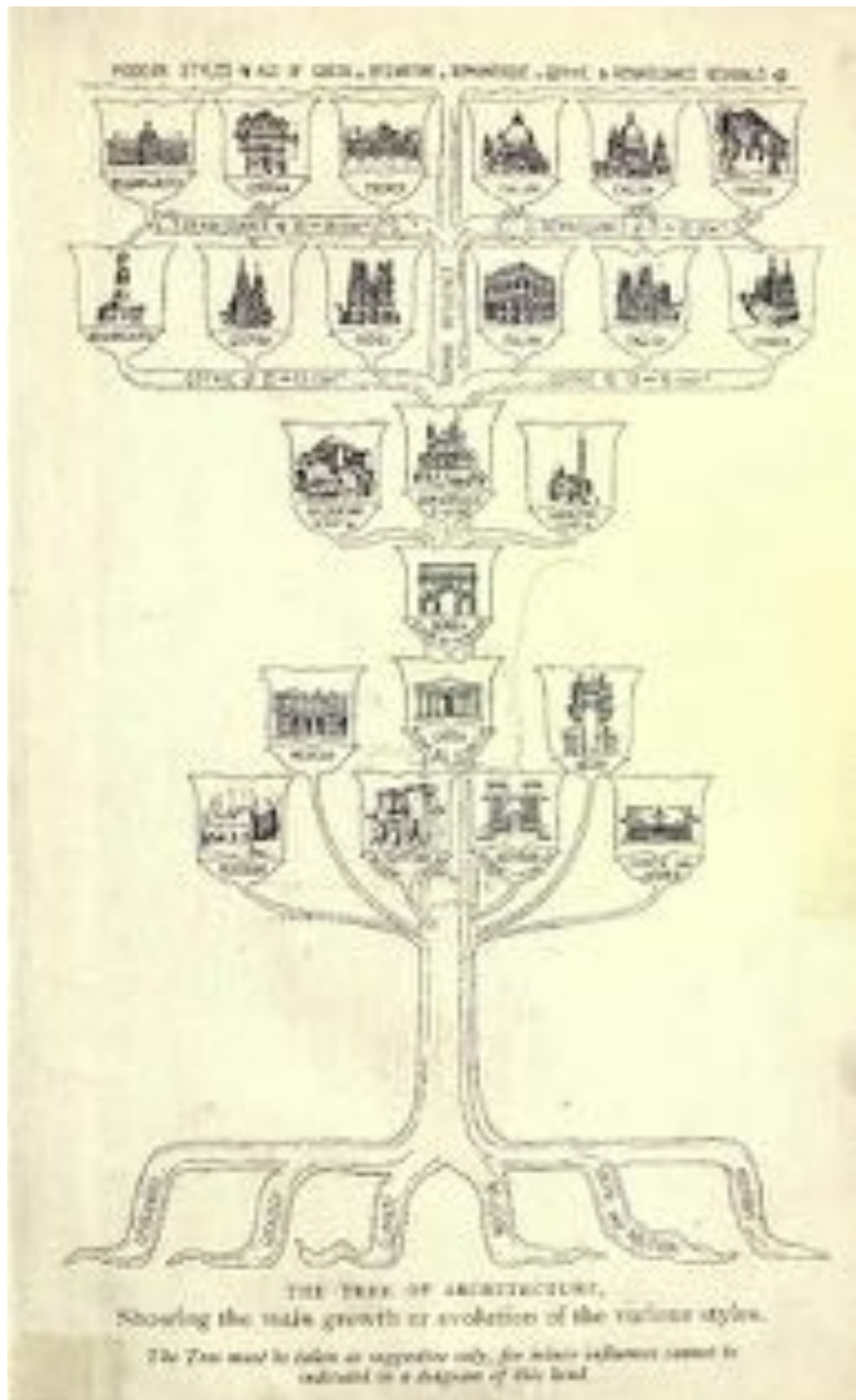


Figure 31. Banister Fletcher's appropriation of Schleicher's family-tree model of linguistic descent to represent the history of architectural style (1896).

HISTORICAL STUDIES
OF
CHURCH-BUILDING
IN THE
MIDDLE AGES

VENICE, SIENA, FLORENCE

BY
CHARLES ELIOT NORTON

London:
SAMPSON LOW, MARSTON, SEARLE, AND RIVINGTON,
CROWN BUILDINGS, 108, FLEET STREET.
1881

Figure 32. Title page of Norton's *Historical Studies in Church-Building in the Middle Ages: Venice, Siena, Florence* (1881).

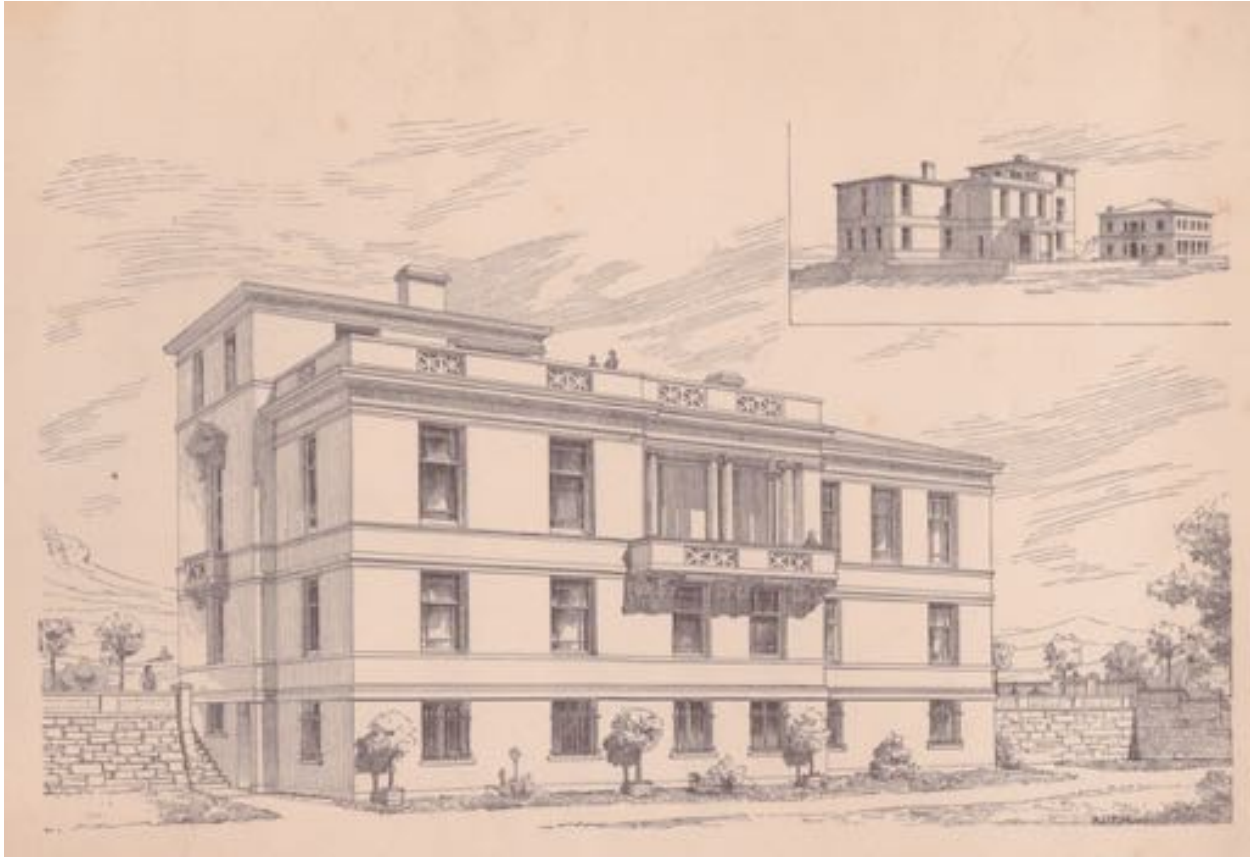


Figure 33. Ware's rendering for the American School of Classical Studies in Athens.
From the ACSA Digital Library.



Figure 34. The American School of Classical Studies during construction. From the ACSA Digital Library.



Figure 35. The American School for Classical Studies soon after completion. From the ACSA Digital Library.



Figure 36. The library for the American School of Classical Studies in Athens. From the ACSA Digital Library.

HISTORY
OF
ANCIENT ART

BY
DR. FRANZ VON REBER

DIRECTOR OF THE BAVARIAN ROYAL AND STATE GALLERIES OF PAINTINGS
PROFESSOR IN THE UNIVERSITY AND POLYTECHNIC OF MUNICH

Revised by the Author

TRANSLATED AND AUGMENTED
BY
JOSEPH THACHER CLARKE

WITH 310 ILLUSTRATIONS AND A GLOSSARY OF TECHNICAL TERMS

NEW YORK
HARPER & BROTHERS, FRANKLIN SQUARE

Figure 37. Title page for Reber's *History of Ancient Art*.



PLATE I. TRACING FROM PHOTOGRAPH. H. W. M.
(Reduced in size about one-third)

Figure 38. Student tracing exercise from Ware's "The Instruction in Architectural Drawing at Columbia University" (1896).

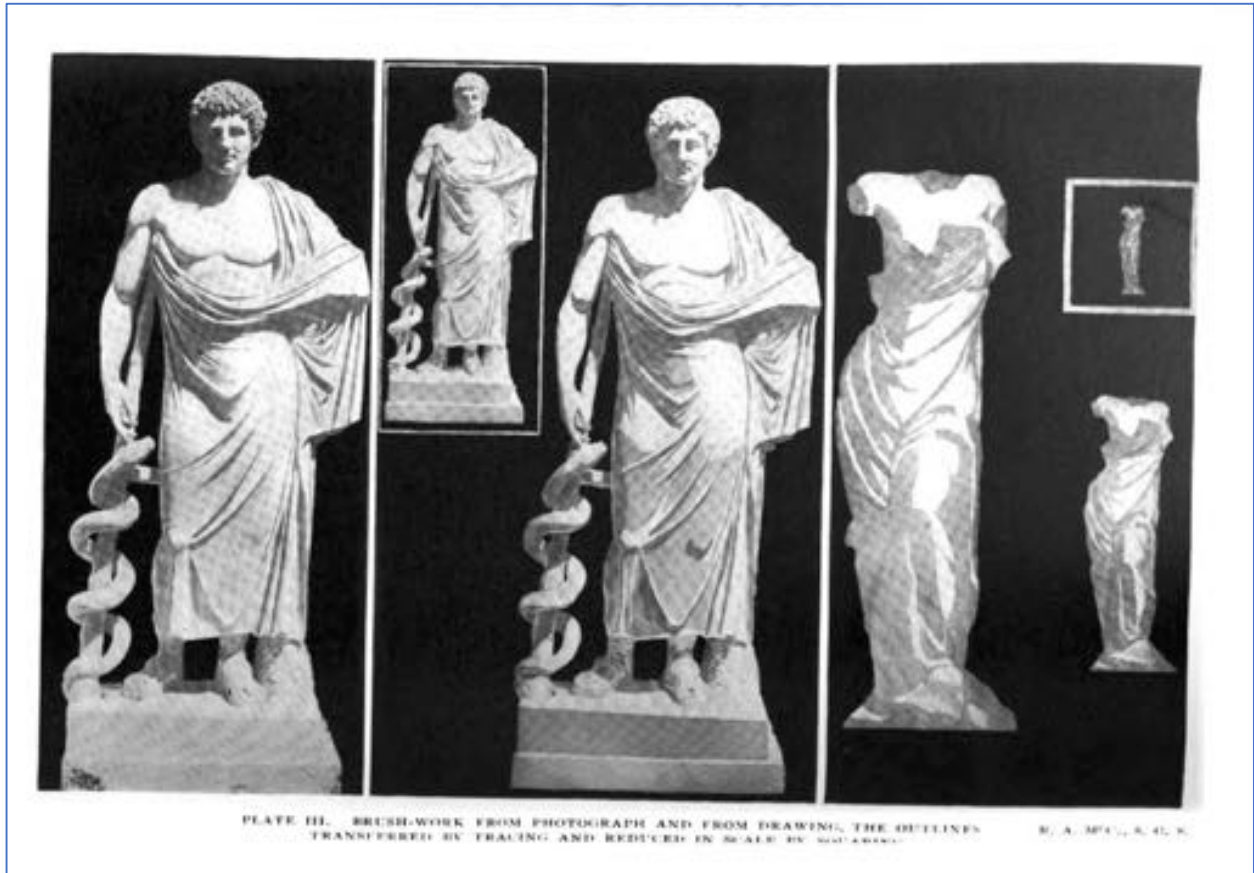


Figure 39. Student brushwork exercise from Ware's "The Instruction in Architectural Drawing at Columbia University" (1896).



Figure 40. Student pen-work exercise from Ware's "The Instruction in Architectural Drawing at Columbia University" (1896).

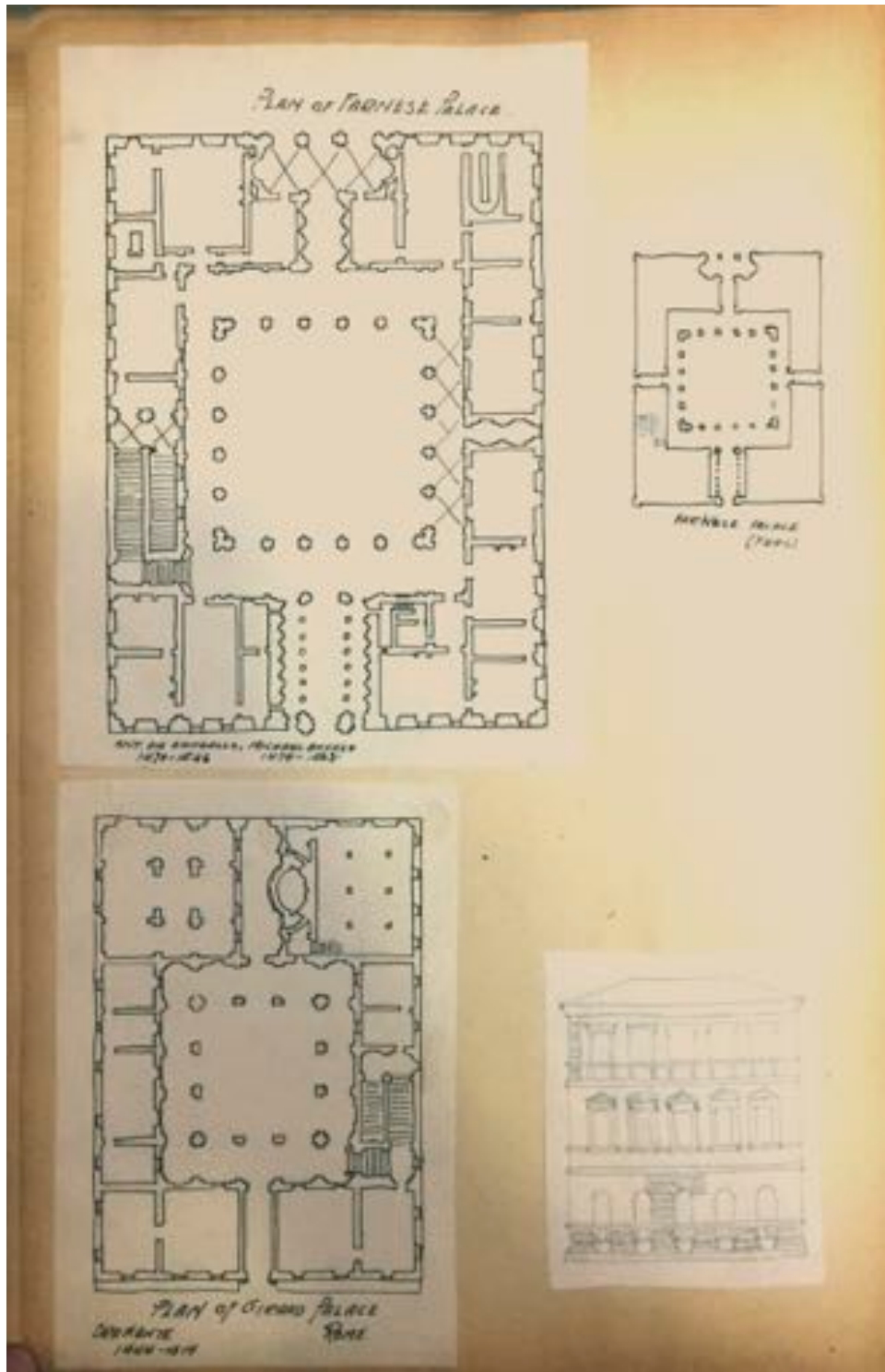


Figure 41. Tracing notebook of Farnese Palace in "Ferg" for "Hamlin History of Arch course." From Lucian E. Smith Collection, 1890-1940, Avery Archives, Columbia University.

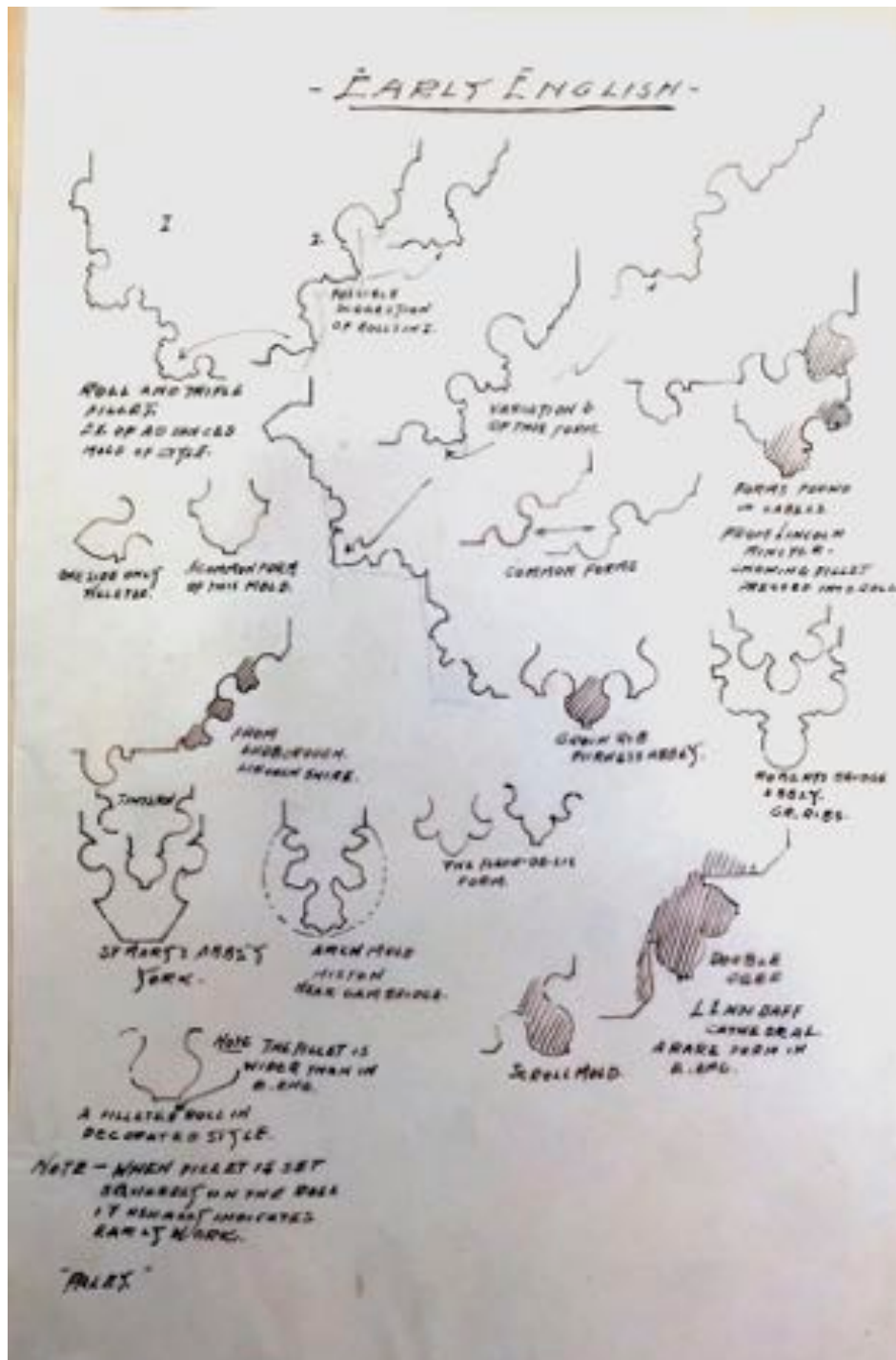


Figure 42. Tracing notebook of molding fillets in the Early English style for "Hamlin History of Arch course." From Lucian E. Smith Collection, 1890-1940, Avery Archives, Columbia University.

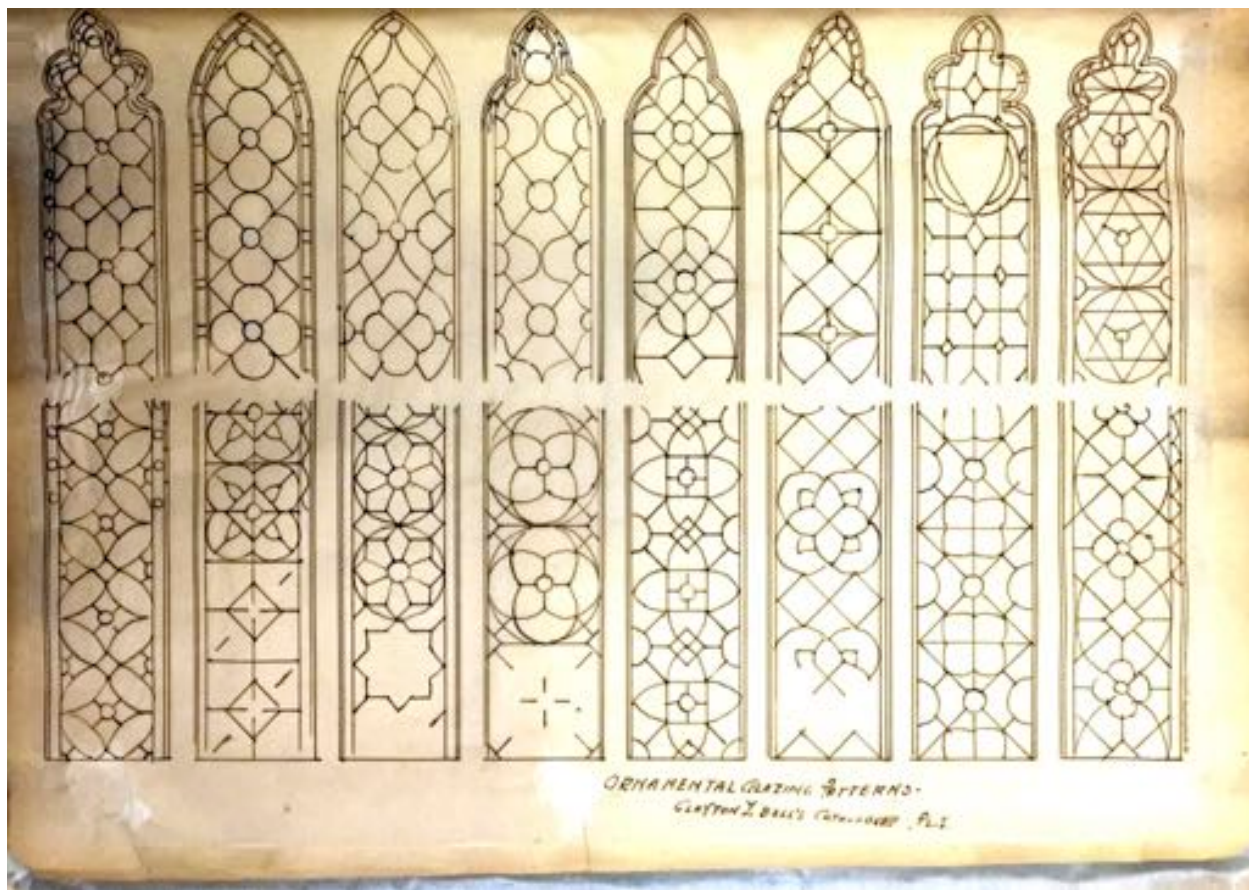


Figure 43. Tracing notebook of ornamental glazing patterns from "Clayton L. Bell's Catalogue" for "Hamlin History of Arch course." From Lucian E. Smith Collection, 1890-1940, Avery Archives, Columbia University.



Figure 44. Tracing notebook of escutcheons in the French Gothic style for “Hamlin History of Arch course.” From Lucian E. Smith Collection, 1890-1940, Avery Archives, Columbia University.

Part II | Architecture as a Liberal Art

VISUAL APPENDIX

Chapter Four

Schooling Design:

The Avery Library and the Bibliographic Order of Collegiate Architecture



Figure 45. Henry Ogden Avery. From H.O. Avery Collection, Avery Archives, Columbia University.

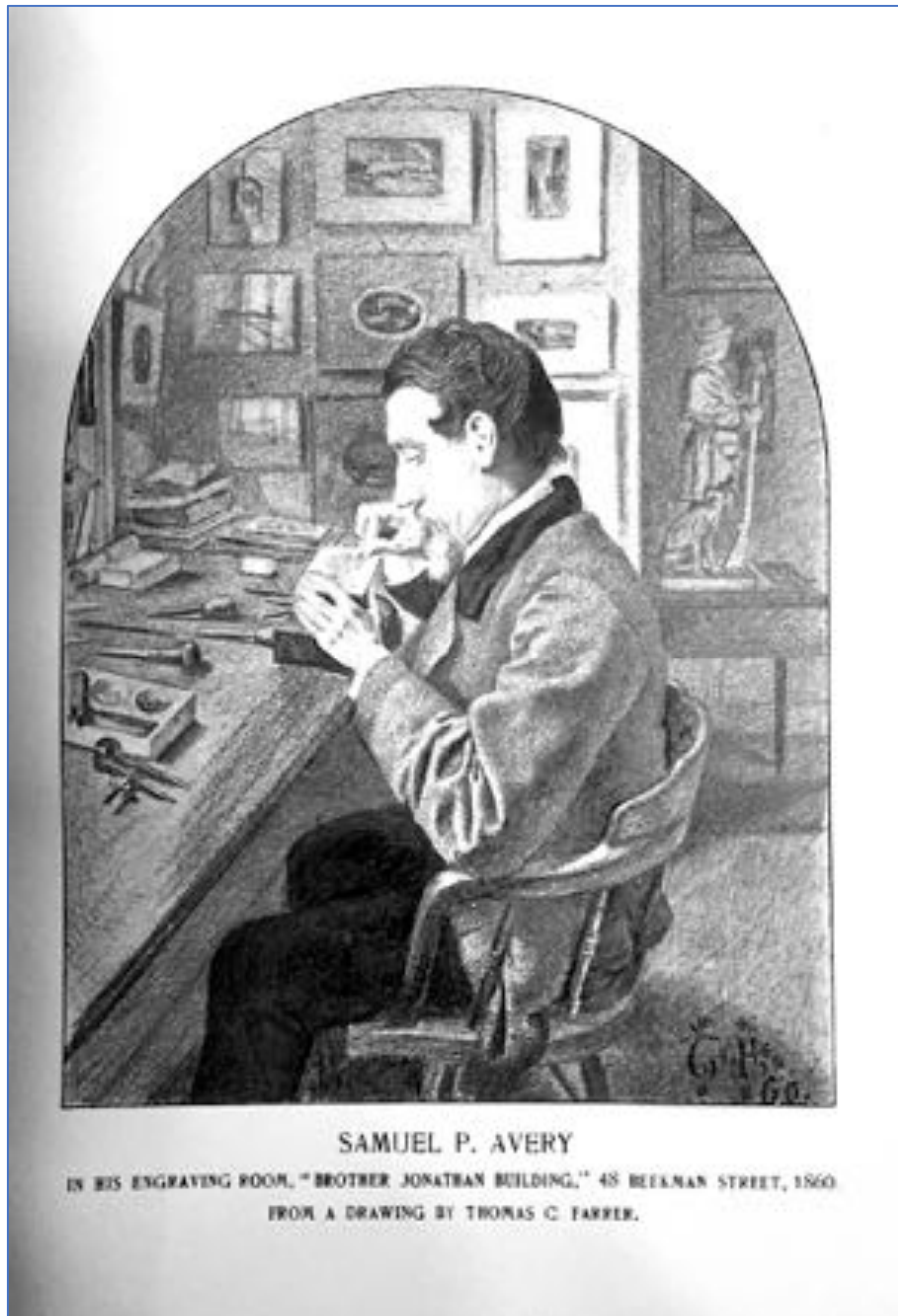


Figure 46. Samuel Putnam Avery, the engraver. From the Samuel Putnam Avery Papers, Metropolitan Museum of Art.

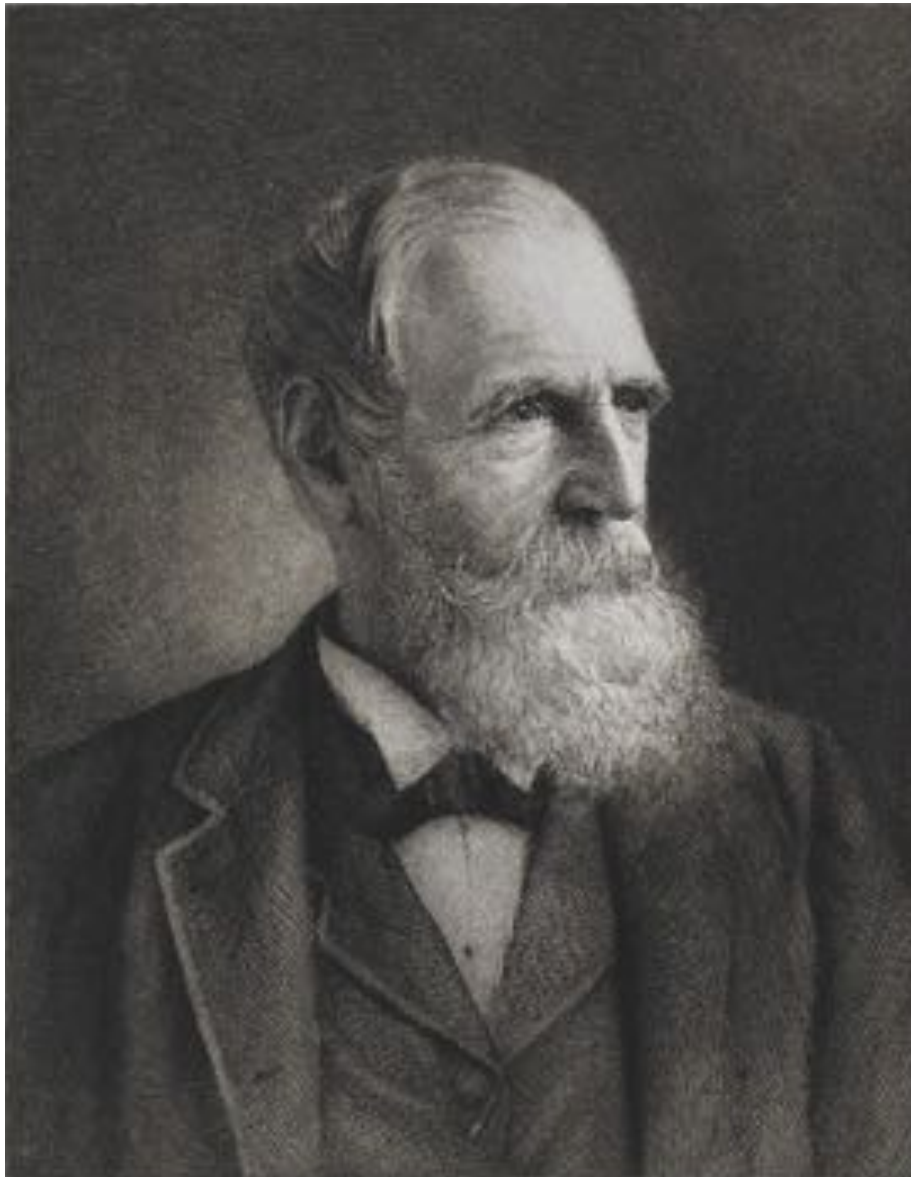


Figure 47. Samuel Putnam Avery, President of the Grolier Club (1896-1900). From H.O. Avery Collection, Avery Archives, Columbia University.



Figure 48. "...Far more seemely were it for thee to have the Study full of Bookes than thy purses full of mony." The bookplate to Samuel Putnam Avery's library. From H.O. Avery Collection, Avery Archives, Columbia University.



Figure 49. The Cast Courts as the South Kensington Museum, featuring a plaster cast fragment of Trajan's Column. From Flour (2008).



Figure 50. Plaster casts in the Cour Vitree of Duban's Palais des Etudes. From Lending (2017).

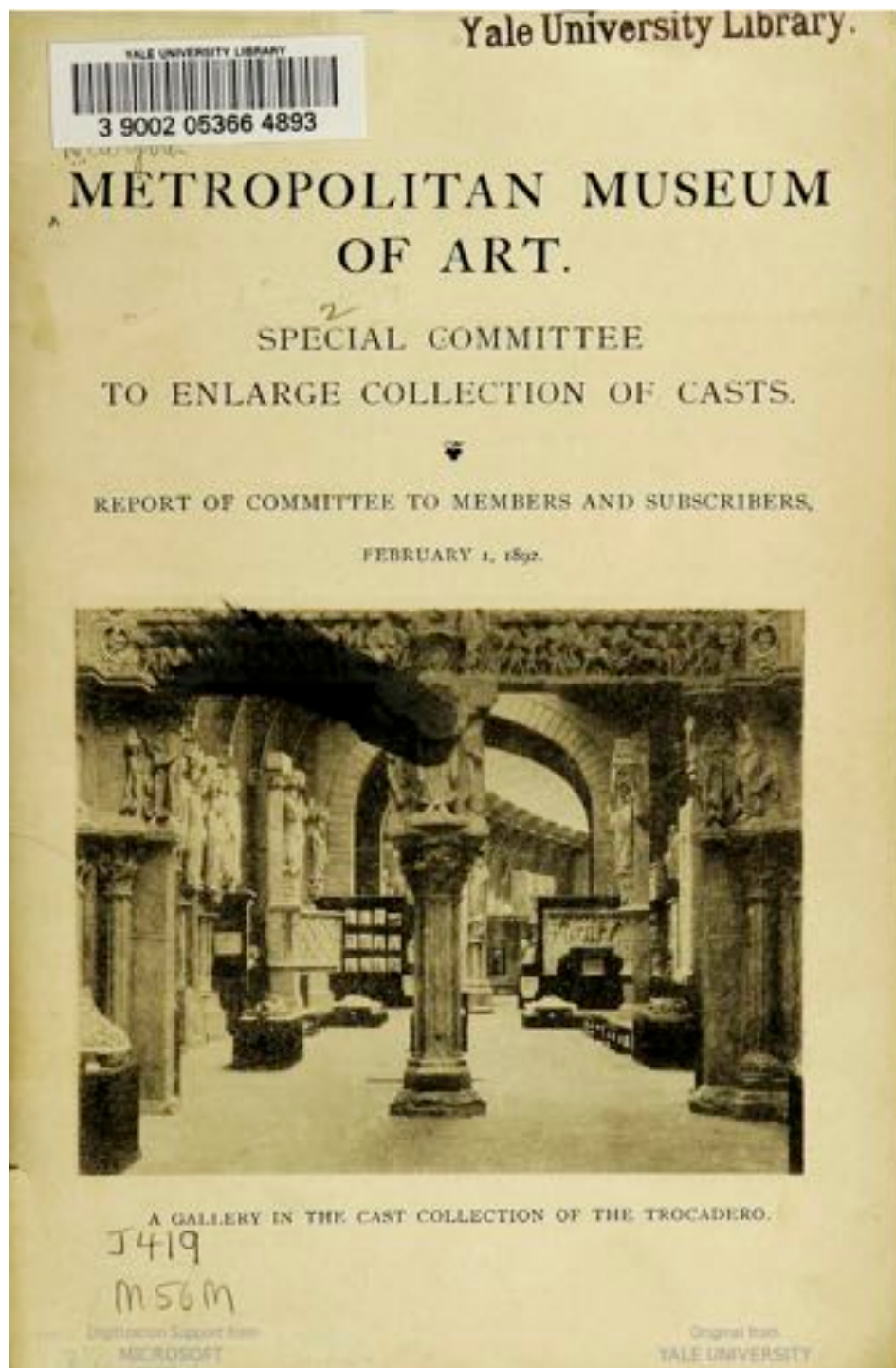


Figure 52. The cover of the Metropolitan Museum of Art's 1892 "Report" of the Special Committee to Enlarge Collection of Casts.



Figure 53. Architectural lecture and drawing rooms in the Rogers Building, M.I.T. MIT Archives. Reprinted in Wigley (1991).



Figure 54. Photograph of Chaplain's 1893 bas-relief memorial for the Avery Alcoves.
From H.O. Avery Collection, Avery Archives, Columbia University.



Figure 55. Drawing of Chaplain's bas-relief memorial, included in the "Catalog of the Avery Library."

American Architectural Books 1801-1890

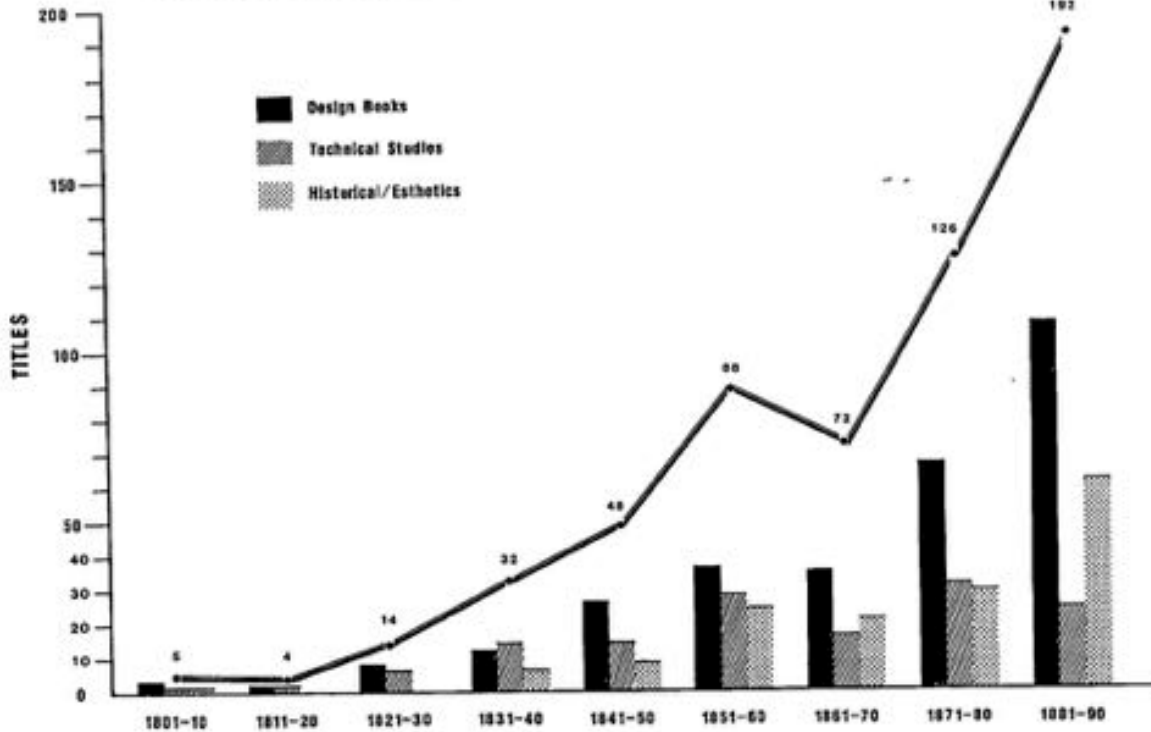


Fig. 131. Books, pamphlets, and so on, relating to architecture published in America between 1801 and 1890, based on Hitchcock.

Figure 56. Reiff's graph for the increase in architectural books published in the United States between 1801 and 1890, based on Hitchcock's inventory. From Reiff (2000).

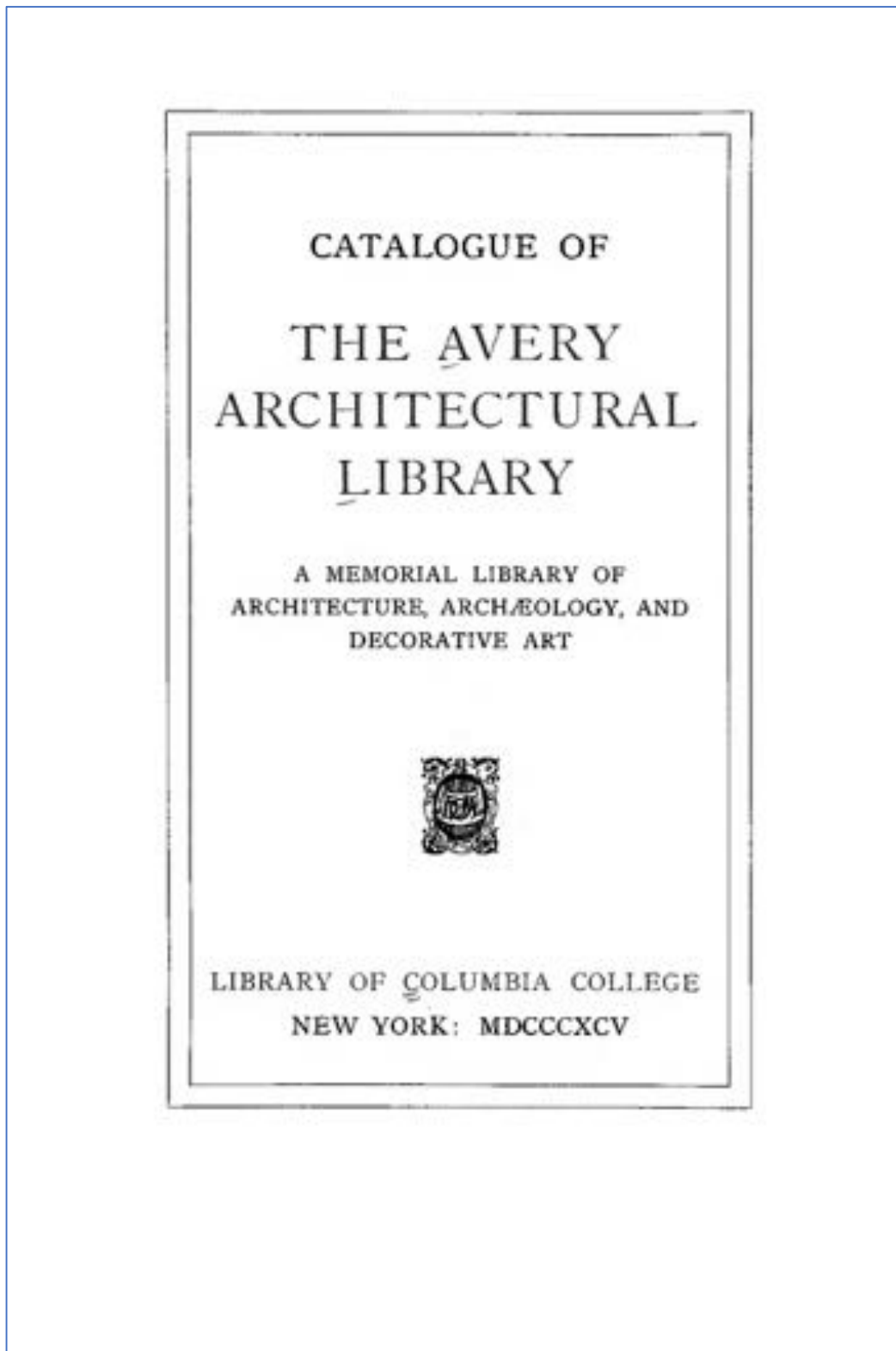


Figure 57. The cover to the original 1895 *Catalogue of the Avery Architectural Library*.

CLASSIFICATION

GENERAL ARCHITECTURE A	ARCHITECTURAL DRAWING AND
PERIODICALS B	PERSPECTIVE L2
SOCIETIES C	NUMISMATICS M1
DIFFERENT SCHOOLS D	WROUGHT-IRON AND METAL
ORIENTAL D1	WORK M2
GREEK } D2	BRONZE WORK M3
ROMAN } D3	GOLDSMITHS' WORK M4
BYZANTINE D3	WOOD-CARVING M5
ARABIAN D4	FRESCO-PAINTING M6
ROMANESQUE D5	GLASS, PAINTED M7
GOTHIC D6	TAPESTRY M8
RENAISSANCE D7	TEXTILE FABRICS N
NORMAN D8	FURNITURE N1
CHURCH E	CERAMICS N2
DOMESTIC E2	GLASS VESSELS N3
FACTORIES, &c. E3	COSTUME N4
THEATER E4	ARMS AND ARMOR N5
BRIDGES E5	INDUSTRIAL ARTS N6
PUBLIC BUILDINGS E6	LANDSCAPE GARDENING N8
FORTIFICATION E7	ART O
MONUMENTAL E8	ART COLLECTIONS O2
HISTORY F	ART EXHIBITIONS O4
BIBLIOGRAPHY F5	ETCHING O5
LOCAL (arranged by countries) H	PAINTING O6
CONSTRUCTION I	DRAWING O62
BUILDERS' HARDWARE & MA-	ENGRAVING O7
CHINERY CATALOGUES I2	SCULPTURE O8
MERCANTILE ARCHITECTURE I4	ARCHAEOLOGY P
NAVAL ARCHITECTURE I5	ARCHAEOLOGY, LOCAL (arranged
VENTILATION AND HEATING,	by countries) R
ACOUSTICS, LIGHTING AND	BIOGEOGRAPHY W
PLUMBING J	HERALDRY W1
PUBLIC HEALTH, &c. J1	FÊTES W2
TILE AND BRICK WORK J2	BIBLIOGRAPHY (general) Y
DECORATION AND ORNAMENT K	MISCELLANEOUS X
DESIGN L	ORIGINAL SKETCHES AND MSS Z

Figure 58. Classification scheme by subject from the 1895 *Catalogue of the Avery Architectural Library*.



Figure 59. Harriet B. Prescott, cataloguer of the Avery Library. From Mount Holyoke archives.



Figure 60. Charles Haight's interior design for initial installation of the Avery Alcove from H.O. Avery Collection, Avery Archives, Columbia University.

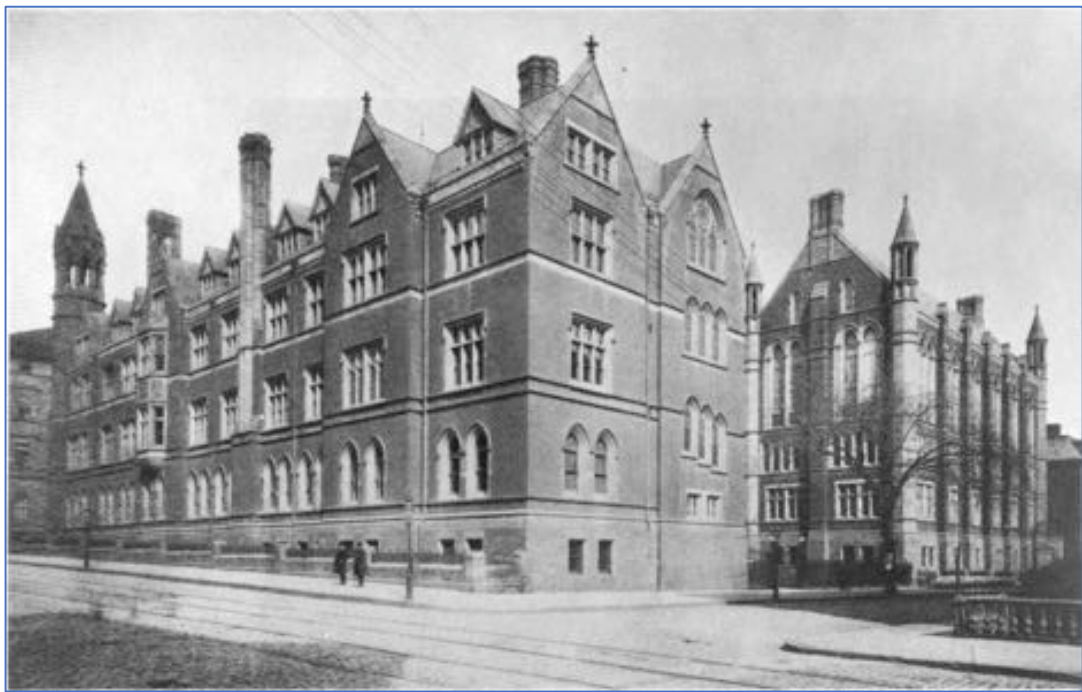


Figure 61. Haight's School of Mines Building on 49th Street. From School of Mines Collection, University Archives, Columbia University.



Figure 62. The expansion of the Avery Alcove in Low Library. From Avery Archives.
From the H.O. Avery Collection, Avery Archives, Columbia University.



Figure 63. Avery Hall, front elevation. Avery Hall Collection, Avery Archives, Columbia University.

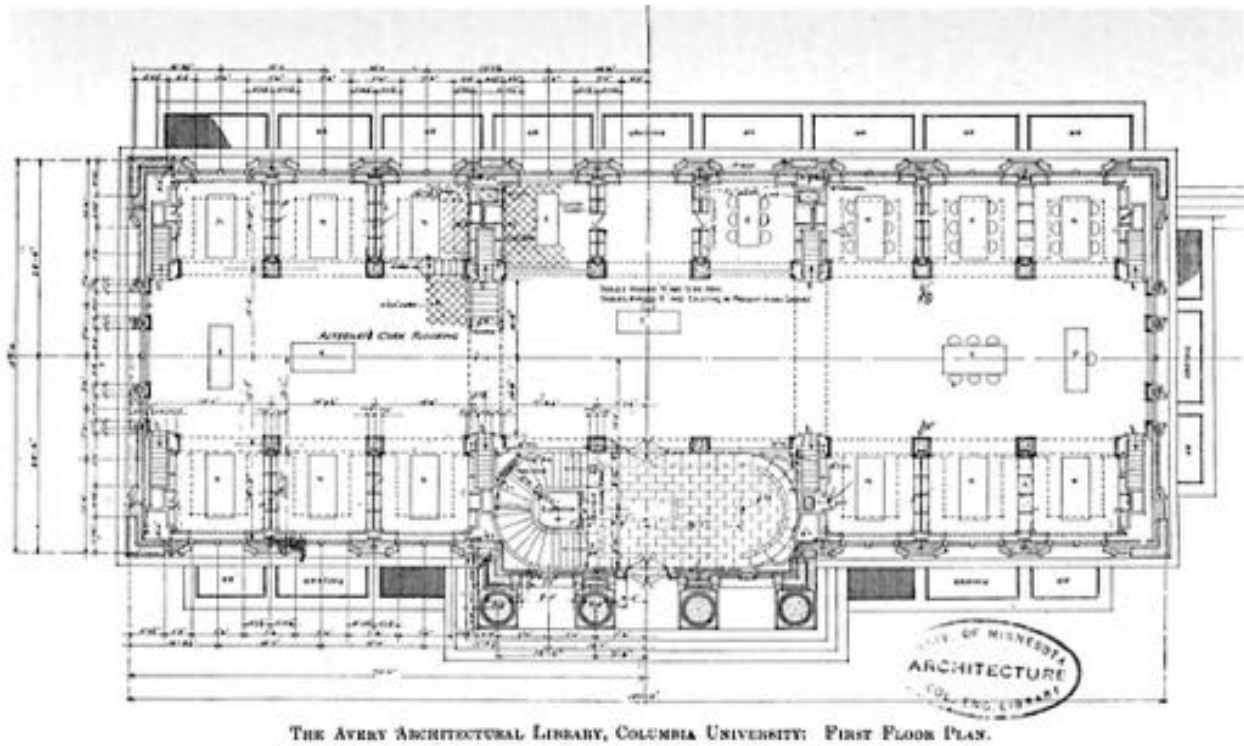


Figure 64. Avery Hall, first floor plan. From Smith (1914).



Figure 65. The interior of the Avery Library in Avery Hall. From Smith (1914).

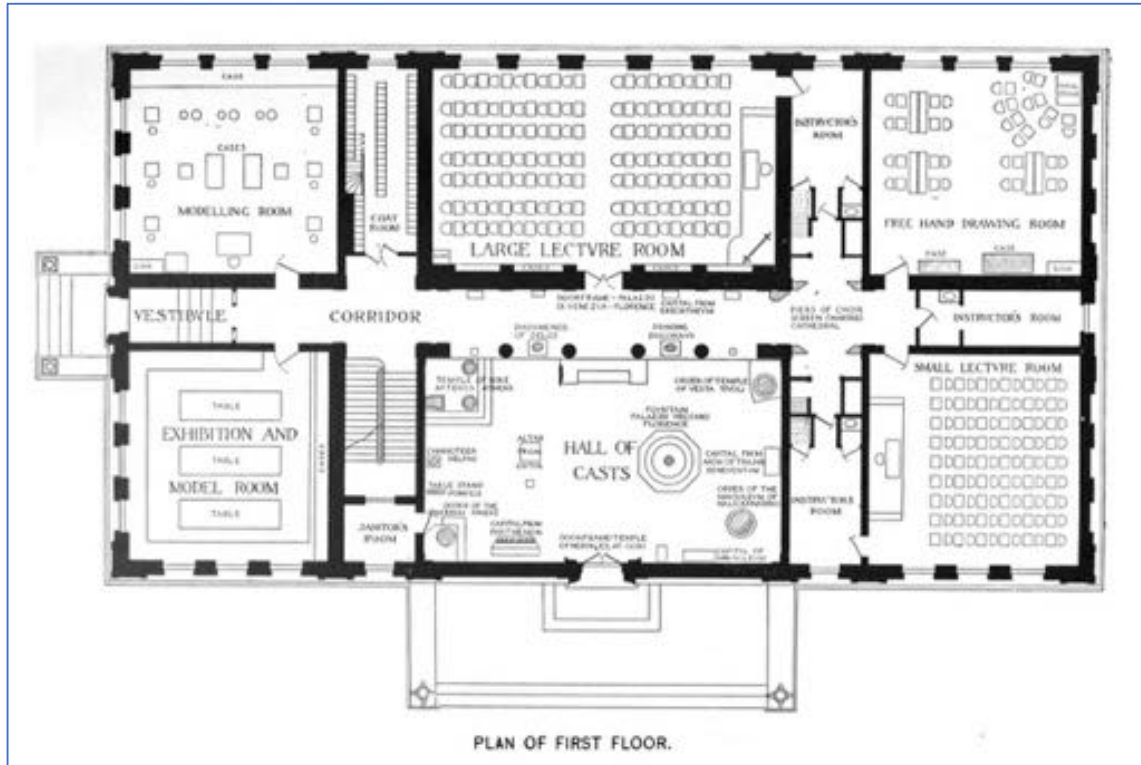


Figure 66. Plan of Robinson Hall, from Alofsin (2002).



Figure 67. Hall of Casts in Robinson Hall. From Pearlman (1997).



Figure 68. The central corridor on the top floor of Havemeyer Hall. From Stuart (1900-1901).

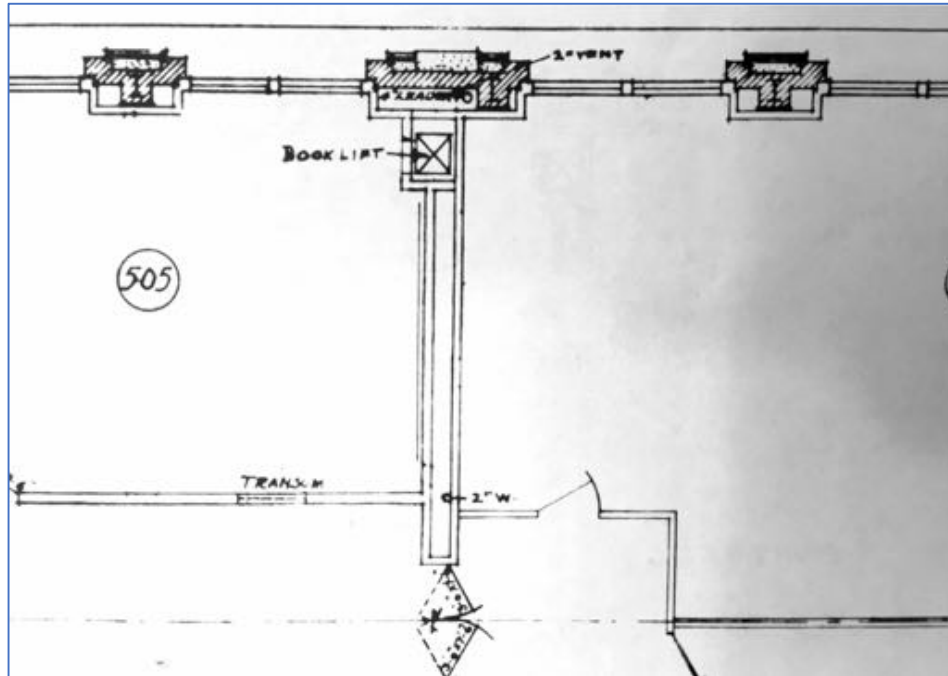


Figure 69. The book lifts in Avery Hall, detail from first floor plan. From the Avery Hall Collection, Avery Archives, Columbia University.

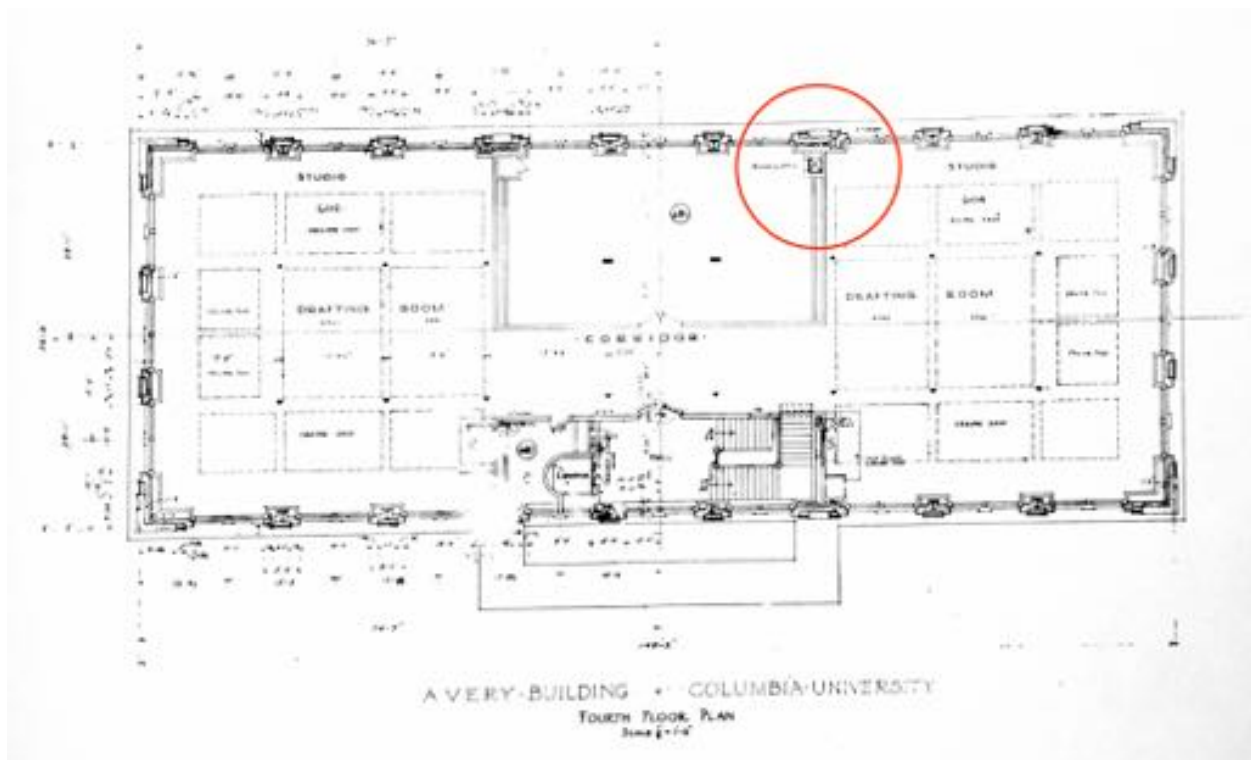


Figure 70. The book lifts in Avery Hall, fourth floor plan. From the Avery Hall Collection, Avery Archives, Columbia University.



"Standing on the bare ground, — my head
bathed by the blithe air, & uplifted into
infinite space, — all mean egotism
vanishes. I become a transparent
Eyeball."

Nature, p. 13.

Figure 71. Christopher Pearse Cranch's 1836-1838 illustration of the "Transparent Eyeball" in Emerson's "Nature" essay. From Cranch Collection, Houghton Library, Harvard University.



Figure 72. Henry Hobson Richardson's private study and library in Brookline, Massachusetts. From O'Gorman (2007).



Figure 73. Hubert Von Herkomer's 1886 portrait of Henry Hobson Richardson. National Portrait Gallery, Smithsonian Institute.

Architecture as a Fine Art

VISUAL APPENDIX

Conclusion
Captains of Erudition and the Collar Line

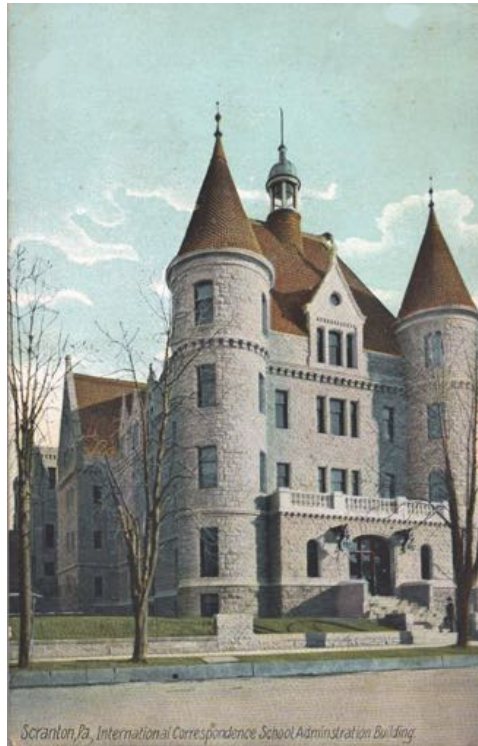


Figure 74. The 1898 Administration Building of the International Correspondence School of Scranton, Pennsylvania. McHugh Special Collections, Scranton University Archives.

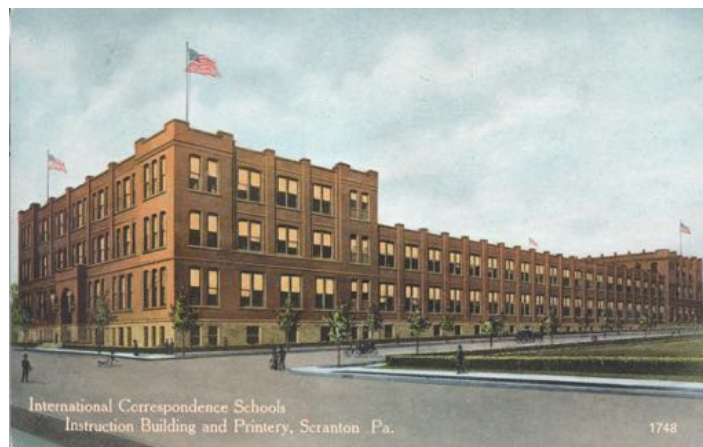


Figure 75. The new I.C.S. Administration Building and Printery in Scranton, built in 1915. McHugh Special Collections, Scranton University Archives.



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Illustrated Catalogue giving detailed information in regard to subjects in each course will be sent on request.

American School of Correspondence
At Armour Institute of Technology
CHICAGO, ILLINOIS

Figure 76. The American Correspondence School at the Armour Institute of Technology in Chicago. From *The Draftsman* (1901).



Figure 77. Title page for *A Treatise on Architecture and Building Construction* (1899), accompanying the I.C.S.'s Complete Architectural Course.

SHADES AND SHADOWS

PART I

INTRODUCTION

Light and Shade.—If a solid object is exposed to sunlight, one side is illuminated and is said to be in *Light*. The sun's rays do not fall upon the other side, which is said to be in *Shade*, and it would be invisible, like the dark side of the moon, if other light were not reflected upon it from other objects, or from the earth or the sky. Thus, at the time of the new moon, the dark side of the moon is often visible by light reflected from the earth.

Line of Light and Shade, or Line of Shade.—The line that separates the illuminated portion of the surface of an object from the portion that is in shade is called the *Line of Light and Shade*, or simply the *Line of Shade*. It lies between the Light and the Shade. It is the boundary between the portion of the surface that is turned toward the sun and that which is turned away from it. The rays of light are tangent to the surface along this line.

Thus, in Fig. A, the line $a c b c'$ is the Line of Shade upon the surface of the sphere. It is a great circle of the sphere, and is projected in the elevation as a Right Line; in the plan, as an Ellipse.

Invisible Shadow, or Shadow in Space.—An object thus exposed to sunlight throws a shadow through space, in a direction away from the sun, parallel to the rays of light. This is called the *Shadow in Space*, or the *Invisible Shadow*, since it cannot be seen when the air is clear. But if the air is dusty or misty, this Shadow appears as a dark ray, or beam, of shadow parallel to the rays of light (Fig. B).

Visible Shadow, or Cast Shadow.—Any object lying in the path of the Invisible Shadow is deprived of sunlight, and, like a surface in shade, it would be invisible if no light were reflected or refracted upon it. It is said to be in the *Shadow* of the object that casts the Invisible Shadow. If it is so large that it is partly in light and partly in shadow, like the screen in Fig. B, so that only part of its surface is darkened, this portion is called the *Cast Shadow*, or *Visible Shadow*, of the object that casts it, or simply its *Shadow*.

Line of Light and Shadow, or Line of Shadow.—The line that then separates the illuminated portion of the second surface from the portion that is in shadow, is called the *Line of Light and Shadow*, or simply the *Line of Shadow*. It lies between the Light and the Shadow. *The Line of Shadow is the shadow of the Line of Shade.*

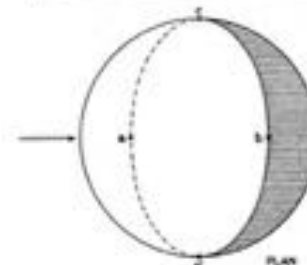
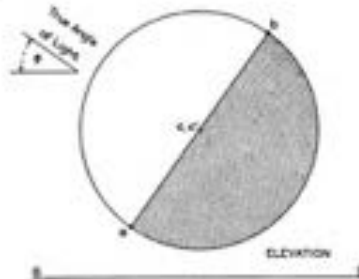


FIG. A

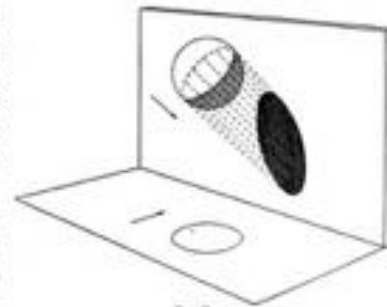


Figure 78. From Ware's *Shades and Shadows* (1912).



Telegrapher to Architect Through the I. C. S.

When I began studying in the International Correspondence Schools, I was a telegraph operator, and knew nothing of drawing or of the profession I am now following. I found no difficulty, however, in mastering the principles given in the Instruction Papers. Through the good offices of the Schools, I have been introduced, and have accepted, a partnership with a well-known architect of this city. I estimate my income at present as three times that which I was receiving when I enrolled—all owing to the instruction I have received from the Schools.

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Mechanical Engineer	Yacht, Boat, Ship, Boatbuilding
Electrical Engineer	Plumbing
Telephone Engineer	International Business
Machine Engineer	Banking
Barber Engineer	Bookkeeping
Civil Engineer	stenography
Marine	Typing
Mining Engineer	To Speak French
Mechanical Engineer	To Speak German
Architect	To Speak Spanish

Name _____
 St. and No. _____
 City _____ State _____

Wilshire's Magazine, March

Figure 79. "Telegrapher to Architect Through the I.C.S." From *Wilshire's Magazine*. Courtesy of McHugh Special Collections, Scranton University Archives.



Are You Held Down

By lack of training in your present work? If so, we can help you. The International Correspondence Schools were founded for the "man without an opportunity." No matter where he is or what work he is doing, they give him, **by mail**, the exact training required to attain success, either in his present position, or in an entirely different occupation. We can prepare you, in your spare time, and at small expense, for any position mentioned in the Coupon. Terms easy. No books to buy.

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<input type="checkbox"/> Mechanical Draftsman	<input type="checkbox"/> Metallurgist
<input type="checkbox"/> Electrical Engineer	<input type="checkbox"/> Chemist
<input type="checkbox"/> Electrician	<input type="checkbox"/> Ornamental Designer
<input type="checkbox"/> Telephone Engineer	<input type="checkbox"/> Navigator
<input type="checkbox"/> Steam Engineer	<input type="checkbox"/> Bookkeeper
<input type="checkbox"/> Marine Engineer	<input type="checkbox"/> Stenographer
<input type="checkbox"/> Civil Engineer	<input type="checkbox"/> Shoe-Cut Writer
<input type="checkbox"/> Surveyor	<input type="checkbox"/> Ad. Writer
<input type="checkbox"/> Mining Engineer	<input type="checkbox"/> To Speak French
<input type="checkbox"/> Sanitary Engineer	<input type="checkbox"/> To Speak German
<input type="checkbox"/> Architect	<input type="checkbox"/> To Speak Spanish

Name _____

St. or No. _____

City _____ State _____

Figure 81. "Are You Held Down," *The National Builder* 34 (November, 1903), 7.



Are You a Cog?

If you are a low-waged carpenter, or a clerk in a store or office, or a "hand" on a farm, and feel that you are like a cog in a wheel, going always but making no progress, fill out and send in the coupon below, and learn how to prepare yourself for a really desirable position.

Mail the Coupon Today!

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Box 876, Scranton, Pa.

Please indicate how I can qualify for position marked X below.

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<input type="checkbox"/> Sanitary Engineer	<input type="checkbox"/> Steam Engineer
<input type="checkbox"/> Plumber & Gas-Fitter	<input type="checkbox"/> Ad. Writer
<input type="checkbox"/> Civil Engineer	<input type="checkbox"/> Ornamental Designer

Name _____
Street & No. _____
City _____ State _____

Figure 82. "Are You a Cog?" *The National Builder* 34 (October, 1903), 7.

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Figure 83. "Better than Money, Architecture Taught by Mail." *Architects' and Builders' Magazine* 1 (December, 1899), 29.



Figure 84. Nicholas Murray Butler in 1921. Prints and Photographs Online Catalog, Library of Congress.

THE PROMISE OF
AMERICAN ARCHITECTURE

ADDRESSES AT THE ANNUAL DINNER OF
THE AMERICAN INSTITUTE
OF ARCHITECTS
1905

COMPILED WITH AN INTRODUCTION
BY CHARLES MOORE
CORRESPONDING MEMBER A. I. A.

WASHINGTON
AMERICAN INSTITUTE OF ARCHITECTS
MCMV

Figure 85. Title page for the A.I.A.'s *The Promise of American Architecture* (1905), including Nicholas Murray Butler's address "The Place of Art in Civilization."

INTERNATIONAL JURY



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DR. M. A. F. C. S. KROHMAN, President

Figure 86. Ware after his academic retirement, serving as a jury member for the Palace of Peace design competition in 1906. From *International Competition of the Carnegie Foundation, the Palace of Peace at The Hague* (London: T.C. & E.C. Jack, 1907).



Figure 87. Ware, from Hamlin's obituary for his mentor. *Journal of the American Institute of Architects* 42 (July 1915), 101.