The Theory of Pure Design and American Architectural Education in the Early Twentieth Century

In May 1901, at the annual convention of the Architectural League of America (ALA), the session on architectural education garnered particular attention. Organized by Emil Lorch, who would soon become chairman of the architecture program at the University of Michigan, the session introduced convention participants to a new pedagogical method: the theory of Pure Design. Lorch and Chicagoan Robert Spencer Jr. explained how Pure Design might benefit architects; Arthur Wesley Dow and Denman Waldo Ross, two leading art educators, endorsed the method; and a lively panel discussion elicited enthusiastic comments from audience members, including Claude Bragdon. At the close of the convention, the reviewer for Inland Architect and News Record prophesied that Pure Design, “entering at a time when old methods proved inadequate, seems destined to entirely revolutionize the form of teaching architecture in the schools.” These are bold words for a theory that, one hundred years later, seems to have disappeared. And yet its popularity occurred just as academic programs in architecture began to flourish and the status of the profession itself became linked to education. This examination of Pure Design retrieves a neglected chapter in American architectural education that precedes the much more familiar story of the impact of the Bauhaus and European modernism after 1930.

Pure Design, a formalist pedagogical method, relied on exercises with abstract design elements—the dot, the line, shape, and color—to encourage the creative ability of students. It depended on, or grew out of, contemporary investigations in science, psychology, art education, and philosophy. Considered within this congeries of activity, Pure Design represents an important shift in American aesthetic thought that affected how architects regarded architecture.

By the 1890s, American aesthetic thought had shifted from a Ruskinian emphasis on the moral and historical value of art, dominant at mid-century, to a focus on form as the primary source of assessing aesthetic merit. Attention to the lines, shape, color, and materials of the art object itself also laid stress on the artist’s creative power and insight. The popularization of Hegelian philosophy and the rise of science contributed to this shift. In Hegelian terms, beauty equaled a unity of form and content; the idea was realized through the work of art, not by a standard outside of it. Scientific investigations also suggested a more objective basis for understanding art and architecture; the new discipline of psychology drew on physiology and scientific method to explain the physical and psychical act of the perception of form.

The shift from a moral to a formalist aesthetic did not, however, mean that architects, artists, and critics set Ruskin entirely aside. As more literal interpretations faded, other aspects of his thought gained prominence. Ruskin’s emphasis on vision, morality, and beauty were now recast within a psychological understanding of the mind and perception. Ruskin himself had insisted that a knowledge of art, both its practice and its history, belonged with the humanities in a liberal arts education; because the end of art was “Beauty,”
its value lay not in the accumulation of technical skills but in the cultivation of the mind.\textsuperscript{4} Since the eighteenth century, beauty was increasingly understood in experiential rather than metaphysical terms, and the late nineteenth-century work in psychology augmented this attitude. Thus, the appreciation of beauty became a central concern.

“Appreciation” now has a pejorative connotation, but at the turn of the century it implied the active use of the observer’s faculties and the sense that those faculties could be guided. In 1905, Harvard psychologist Hugo Münsterberg urged outright that “the power of aesthetic appreciation must be developed in early youth.”\textsuperscript{5} Americans had a mounting obsession with appreciation and the assessment of artistic merit that assured discussions of art and beauty did not remain in intellectual circles. A cottage industry in “how to” books reached a popular audience: Russell Sturgis’s \textit{How to Judge Architecture: A Popular Guide to the Appreciation of Buildings} (1903) found such a niche that it went through six printings in one year.\textsuperscript{6} Clearly, some Americans wanted a yardstick for discrimination.

Authors like Sturgis hoped to strengthen the faculties of appreciation in their readers by striking a balance between the respective roles of history and technology; architects faced the same challenge. For many the eclecticism of the nineteenth century signaled a lack of direction and sound principles, which forestalled the development of a modern American architecture. In 1890, Henry Van Brunt argued forcefully that “the education of the modern architect would be justified if it had done nothing else than to put an end to this absurd ‘battle of the styles’.”\textsuperscript{7} The burst in technology after the Civil War—the new materials, tools, and processes in the building trades—exerted its own pressure on the use and place of history within education. American architects knew well that technology had fast outstripped the established historical styles. To ignore new materials or structural innovations seemed foolhardy, but to abandon design to the engineers seemed even more so. In response, many architects reaffirmed the status of architecture as an art. Leopold Eidlitz, an architect often associated with a functional approach, still made construction secondary to the art of architecture: “Architecture in the abstract is the art of representing and expressing in the \textit{organism} of a structure, \textit{the idea} which has given rise to its erection. The science of construction . . . though a necessary and fundamental element in the education of the architect, forms only an important \textit{accessory} to the art itself. . . . The problem of the architect is to represent productions of the mind.”\textsuperscript{8} Education should strengthen the mind so that it governed the place of history and technology within design rather than remain determined by them.

Education had to go beyond knowledge of historical precedents, compositional rules, or construction. Architectural educators seeking to define the advantages of academic education over apprenticeship repeatedly returned to the development of the mind. Lorch’s session at the ALA addressed precisely this point, and the response of the attendees suggests a consensus of thought. As one participant wrote, “The creative faculty, the art instinct, the artistic imagination, is the most valuable and most essential quality that the architect can have or acquire; it is the essential element in all great art. To awaken and develop this faculty is the greatest opportunity of the architectural school.”\textsuperscript{9} Pure Design struck a chord because it brought education to the font of creativity itself.

This essay begins by establishing the concept of Pure Design espoused by Dow and Ross. It then examines the application of this aesthetic theory in architecture, focusing on the architecture programs at Harvard and the University of Michigan, its use by architects with Beaux-Arts or Arts and Crafts affiliations, and its presence in design textbooks. Scholarship on architectural education at the turn of the century tends to create an unintentional bifurcation between Beaux-Arts influenced programs versus non–Beaux-Arts, between East Coast and Midwest schools of architecture; this approach can obscure shared concerns.\textsuperscript{10} Because it appealed to a wide variety of architects, a closer examination of Pure Design offers a more synthetic understanding of the assumptions and goals of architectural education in the early twentieth century.\textsuperscript{11} It also illustrates how the presence of a formalist aesthetic provided a foundation for the later response to European modernism.

The Theory of Pure Design

Pure Design received its initial formulation from Arthur Wesley Dow (1857–1922) and Denman Waldo Ross (1853–1935). Dow achieved a reputation as an artist in the 1890s, but by the turn of the century he became a leading figure in art education through his position at Pratt Institute (1895–1903) and as director of the Department of Fine Arts at Teachers College, Columbia University (1904–22).\textsuperscript{12} Ross is best known as a design theorist, art educator, and collector of art. He taught at Harvard from 1899 through the mid-1920s and served as a trustee at Boston’s Museum of Fine Arts (MFA). His theories would influence Roger Fry, Ashcan School artists, and a generation of Harvard-trained museum directors and curators.\textsuperscript{13} In the 1890s Dow and Ross began to develop a series of exercises for students that relied on abstracted or “pure” design elements: dots, lines, shapes, and color (Figures 1, 2). The exercises were not intended to develop a new style or to negate historic

\textbf{THE THEORY OF PURE DESIGN AND AMERICAN ARCHITECTURAL EDUCATION} 249
Figure 1  Arthur Wesley Dow, Composition (1899; 3rd ed. 1900), page 17, depicting examples of line-ideas
styles in architecture or representation in art. Dow and Ross presented them as a pedagogical alternative to current methods for art instruction. French academic methods, they believed, relied too heavily on rote drills and the goal of mimetic representation; and the methods of Walter Smith, a protégé of Henry Cole’s South Kensington system and director of the Massachusetts Normal Art School, they deemed restrictive and mechanical. Dow and Ross hoped their exercises would kindle the “creative faculties” of students and equip them to appreciate and produce good design in any style and medium. Like Ruskin, they believed that a sense of beauty and imagination extended beyond art practice to improve all aspects of a person’s life.14 They wanted to activate the mind as well as train the hand.

Dow and Ross’s efforts rode a rising tide of American interest in creative faculties. Nineteenth-century educators such as Johann Pestalozzi and Friedrich Froebel had long correlated art activities with the development of the child’s mind, and after mid-century few Americans would have disagreed with Ruskin’s dictum that anyone could learn to look. By the 1870s Froebel’s kindergarten gifts found an eager audience, and in 1896 John Dewey set up his laboratory school in Chicago. Dow and Ross gained attention because they provided a method easily adapted to the classroom that was effective with both adults and children.15 Dow started teaching in 1895 and Ross in 1899; by the first decades of the twentieth century they had earned national and international reputations.

Although Dow and Ross are usually considered in tandem, they did not share identical views. They knew each other through Boston’s art circles; however, each man independently worked out his methods, and there remain significant differences in emphasis. Dow used the exercises to foster subjectivity whereas Ross aimed at objectivity. While these differences can lead to confusion about Pure Design, they also account for its broad appeal. Their work was absorbed by the two strains of abstract modernism that developed in the twentieth century. To better understand Pure Design, each man’s contribution will be separately considered.

Arthur Wesley Dow

Originally from Ipswich, Massachusetts, Dow traveled to Paris in 1884 to study art at the Académie Julian. Academy teaching, however, with its goal of accurate representation and concomitant reliance on copying casts and drills, seemed insufficient to Dow when he thought about the role of art in contemporary society, particularly for Americans. Searching for alternatives, Dow turned to two books by Charles Blanc, *Voyage de la haute Égypte* (1876) and *Grammaire des Arts du Dessin* (1867), which addressed the place of art within specific societies but also extracted universal principles. Dow returned to Boston in 1889 and began his own quest for principles suitable to America. In 1891 he discovered Japanese prints, writing that “one evening with Hokusai gave me more light on composition and decorative effect than years of study of pictures.”16 He started a summer school that same year and experimented with new ways to teach art; he also reconsidered the role of craftsmanship and materials for the artist and began making woodblock prints. His eagerness to learn more about Japanese art led to a friendship with Ernest Fenollosa, curator of the Oriental Department at the MFA, who in 1893 appointed Dow as assistant curator. Fenollosa had a formative impact on Dow; indeed, it is no exaggeration to say that he established the framework within which Dow operated until the end of his career (a debt Dow always acknowledged).

In his discussions of art, Fenollosa always returned to two words: imagination and individuality.17 Fenollosa regarded art as the visible manifestation of the imagination. A stronger, freer imagination in turn allowed the students to realize themselves more fully as individuals. Verbal explanations or rules in no way equaled the direct experience of seeing and feeling, yet art educators had failed to realize this: “We have educated our children too much to think, too little to see and feel wholes.”18 To encourage seeing and feeling, Fenollosa drew attention to what he termed the structural elements of art—line, spacing, and proportion—and dispensed with representation: “Representation is not...
art, it is literature. That a picture represents a man does not interest us. . . . It is a question of spacing, of how the pattern is worked out, that interests us . . . not the realistic motive but the desire to find finer and finer space relations and line relations. The visual idea, as he termed it, was something comprehended through the experience of form alone, without a story, without a narrative, without an explanation. This presented a challenge: how could this type of seeing and feeling be taught? Fenollosa advocated a synthesis of Eastern and Western principles of art and turned to Dow, a trained artist, to develop an instructional program. Their close work on a new pedagogy yielded a joint appointment at the Pratt Institute in 1895; after a scandalous affair forced Fenollosa to depart for Japan in 1896, Dow promoted and developed their method on his own.

In 1899 Dow published his seminal statement on design instruction, Composition: A Series of Exercises Selected from a New System of Art Education. The book achieved instant and lasting success—it went through twenty printings by 1941 (with a recent reprint in 1997). He purposely gave the book a handcrafted look by illustrating it with black-and-white relief cuts and printing the text on the soft paper associated with woodblock prints. Dow argued that, since the time of Leonardo da Vinci, the teaching of drawing had become too scientific. The academic emphasis on copying and drills did not encourage the creative sensibility of the student: “when we try to combine various objects, as for instance, hills, trees, and a river, into a picture, we feel the need of a new faculty which is but imperfectly developed; in short, the ability to compose, the creative faculty, not the imitative.” Encouraging this creative faculty became Dow’s goal. As he wrote in his preliminary “Note”: “Unless appreciation has developed despite the crowding of other things, the chances are that his [the student’s] work will lack the one vital element for which art exists, and to which he has yet given the slightest attention—that is, Beauty.” Composition thus becomes the process of awakening creative faculties that allow the student both to produce and appreciate art. Dow began with an explanation of materials and tools and then turned to exercises based on three design elements: line, color, and notan (the Japanese term for the balance of light and dark in a composition). The bulk of Composition explored line and notan. His new system, he wrote, allowed the student “to think of a picture first as pure design, secondly and subordinately as Representation.”

Line was critical for Dow because it allows the artist to organize the space of the art object. The balance and handling of space are determined by what he called the “line-idea”: “The designer and the picture-painter start in the same way. Each has before him a blank space on which he sketches out the main lines of his composition. This may be called his line-idea, and on it hinges the excellence of the whole, for no delicacy of tone, or harmony of color can remedy a bad proportion.” The first exercises in Composition address the division of space within a square (see Figure 1). “This exercise, if carried on under competent criticism, will have begun in a small way a development of the inventive faculties, 2. Appreciation of Beauty, and 3. Power of Expression.” Although these exercises have a formal similarity with the later work of artists such as Mondrian, Dow regarded them as exercises to cultivate creativity, not finished works of art (he always maintained reservations about contemporary abstract art). He followed the exercises with examples in which he applied line-ideas to representational art (Figure 3) and historical styles in architecture and the decorative arts (Figure 4). His focus on composition also led him to favor the term “notan” over “chiaroscuro” because notan placed greater stress on overall pictorial organization and balance whereas chiaroscuro served as an academic tool for shading and naturalistic representation (Figures 5, 6).

Dow made no distinction between the fine and decorative arts, which he equally valued for their compositional merits. He consistently referred to painting, sculpture, and architecture as “space-arts” and believed that the two-dimensional compositional exercises developed the sense of space necessary for art appreciation. In 1895 he wrote, “if a child can appreciate a fine spacing in a rectangle, he can appreciate the façade of [McKim, Mead & White’s Boston] Public Library.” Appreciation of the library rests not in recognizing its knowledgeable use of historical precedents, its choice of the classical tradition, its cultural equation with the Italian Renaissance, or its social contribution as a people’s palace, but solely in apprehending its composition of line. Dow summarily dismissed any external associations, Ruskinian or otherwise, in the appreciation of the building.

For Dow, any style or subject had validity if it exhibited good design; aesthetic merit rested on the success of the formal arrangement. In his exercises for notan he wrote, “a placing together of masses of dark and light, synthetically related, conveys to the eye an impression of beauty entirely independent of meaning.” Appreciation thus relied not on knowledge of history but on the visual training of the eye. As he told his students, “we, in this class, are not so much interested in facts and dates and methods and rules, as we are in the quality—to know that a temple is Doric is not enough—we wish to know if it is a good Doric, and why.” As this statement reveals, Dow’s attention to form never meant he rejected the past. He hoped to train the eye with historical examples as well as the exercises with line and notan. Throughout Composition,
Figure 3  Dow, Composition, page 26, depicting line-ideas applied to a representational subject.

Figure 4  Dow, Composition, page 23, depicting line-ideas applied to architecture and the decorative arts.
Figure 5 Dow, *Composition*, page 38, depicting a demonstration of *notan* with two tones in an exercise with lines.

Figure 6 Dow, *Composition*, page 48, depicting a demonstration of *notan* with two tones in an exercise with a representational subject.
whether referring to masters of Western or Eastern art traditions (for example, Giotto, Michelangelo, Hokusai, or Sesshu), he discussed their merit in terms of form. For example, he used the perception of line to explain the success of the Parthenon: “The harmonies of the Parthenon are the harmonies of line. The beauty of the Parthenon is largely the beauty of line. Why do not the copies and restorations affect you as the original does? Why are we so indifferent in the presence of so much modern classic architecture? Because the difference between a supreme work and an ordinary work is unmeasurable, changes very slight to the eye.” Dow’s assessment relied entirely on the visual perception of the building’s form. He could apply the same type of assessment equally to a Gothic cathedral or Japanese temple; the formal perfection not the particular style mattered. As Dow more bluntly stated in 1908, “historical styles will now serve as examples of harmony, not as mere models.”

**Denman Waldo Ross**

A trustee of the MFA with oversight of the Asian collection, Ross knew Dow and Fenollosa. However, their common interests masked different aims. In Ross’s view, contemporary artists and educators had strayed too far from Leonardo and science. In place of the subjectivity valued by Dow, Ross hoped to provide a scientific understanding of universal principles. Where Dow avoided science, Ross embraced it: “My purpose, in scientific language, is to define, classify, and explain the phenomena of Design.”

Ross’s thinking assimilated an Emersonian transcendentalism and admiration for Ruskin’s teachings with a fervor for scientific method. As a student at Harvard he attended Charles Eliot Norton’s history of art class but focused his studies in history and obtained a doctorate under Henry Adams in 1880. Ross’s education shaped his future work in design: from Norton he learned that art must express an idea, and from Adams he learned scientific history (a methodology developed by German historian Leopold von Ranke that urged scholars to gather facts from primary documents and from them abstract universal principles). Believing that the methodology of science could clarify the practice and appreciation of art, in the late 1880s and 1890s Ross transferred his training in scientific history to art. He collected art objects instead of facts (eventually amassing over sixteen thousand items) and from them drew his universal principles. To understand the practice of art itself, he took art classes with Ruskin’s American disciple Henry R. Newman and spent time at the Académie Julian. He turned to geometry more deliberately than Dow, and to the new science of physiological psychology.

Ross’s 1901 essay “Design as a Science” argued for the union of art and science through design: “as science rises from particulars to what is general and universal, as she rises to the understanding of principles and laws, causes and sequences, she comes to a conception of nature as pure design. The statement of scientific truth becomes an illustration of pure design, and art and science become one.” For Ross, science discovered the inherent order of the universe. Design in art, like science, also searched for order: “By design I mean order in human feeling and thought and in the many and varied activities by which that thought or feeling is expressed.” Ross defined design as a process; the act of design brought order to the artist’s idea and to technical execution. Ross agreed with Dow that beauty was the goal of art, but he spoke of beauty in terms of order: “While I am quite unable to give any definition or explanation of Beauty, I know where to look for it, where I am sure to find it. The Beautiful is revealed, always, as far as I know, in the forms of Order, in the modes of Harmony, of Balance, or of Rhythm.” In “Design as a Science” Ross provided his definition of Pure Design: “Design in which there is no representation, or in which the elements of representation are not considered as such, may be called Pure Design. This may be defined as the arrangement or composition of spots of paint for the sake of balance, rhythm, and harmony; for the sake of consistency, unity, beauty. Pure Design appeals to the eye just as much as music appeals to the ear.” Ross made the analogy with music to convey his strictly formal interest.

Ross codified his thoughts in *A Theory of Pure Design: Harmony, Balance, Rhythm, with Illustrations and Diagrams* (1907, reprinted 1933). Like Dow’s *Composition*, his book focused the student’s attention on design elements, which included the dot, line, outline, and color (color served as the central concern here and in later publications), and provided examples of their combination according to harmony, balance, and rhythm. Gone however are Dow’s crafted look and hand-drawn images; Ross marched through his text with numbered paragraphs and not one illustration of a specific work of art or architecture. By eliminating historical examples from his book, Ross focused on the reasoning rather than the result.

Ross’s reliance on mathematics, particularly geometry, reveals itself from the start. The frontispiece of the book contains a quotation from Plato’s *Philebus*—“Socrates says: ‘If arithmetic, mensuration, and weighing be taken out of any art, that which remains will not be much.’” In other publications and lectures he frequently quoted Henri Poincaré’s statement that mathematical laws expressed a “universal harmony of the world [that] is the source of all beauty.” He described the position of dots in degrees and defined the directions of lines mathematically (Figure 7).
Outlines he considered by the measure of their intervals (Figure 8). In his classes, Ross showed reproductions of art and architecture with superimposed grids, such as Sansovino’s library, to demonstrate harmonious compositions (Figure 9). His discussion of color relied on the geometry of the harmonic scales in music.41

Ross also sought an objective way to bring order to the composition of the design elements. Rather than rely on the subjectivity of feeling in composition, Ross provided statements about the eye’s perception of form. For example, in reference to Figure 10 he wrote: “Intricate shapes from which the eye cannot easily or quickly escape often hold the eye with a force which must be added to that of their tone-contrasts”; or for Figure 11, “it will be observed that the force of the symmetrical enclosure should be sufficient to overpower any suggestion of movement [in the dots].”42 In Figure 2 he tried to balance the eye’s perception of length, convergence, and intricate shapes. These statements signal Ross’s awareness of one of the newest sciences in the late nineteenth century: scientific psychology, particularly physiological psychology. Associated primarily with Germany, psychologists such as Wilhelm Wundt conducted experiments to measure the correlation between sensory perception and mental judgment; of all the senses, vision received the most attention.43 Ross’s incorporation of scientific psychology indicates an understudied avenue of transatlantic exchange in architectural history.44

Physiological psychology made its way from Germany to the United States by the 1880s, and in 1891 William James provided a critique in his Principles of Psychology. James was soon joined on the faculty at Harvard by George Santayana and Hugo Münsterberg, both of whom had studied physiological psychology in Germany. Harvard became a nexus for investigations in the field and, in Münsterberg’s view, the lead American institution.45 This would have direct relevance for Ross, who knew all three men personally. More than the Germans, Americans placed greater emphasis on the application of psychology to human activity; Santayana and Münsterberg applied it specifically to aesthetic appreciation.46 Santayana taught a popular course between 1892 and 1912 that resulted in The Sense of Beauty (1896). This important book argued that the sense of beauty depended on the perception of form, not historical associations or knowledge, and that appreciation grew with practice. Santayana used a variety of arts, including architecture, to support his claims.47 Münsterberg, a student of Wundt’s, left Germany to teach at Harvard from 1892 through 1895 and 1897 through 1916 and had responsibility for the laboratory. He published the results of his investigations in The Principles of Art Education (1905) where he says without equivocation, “every curve or line or space-division is thus psychologically a system of eye movement sensations.”468 Like Santayana, he also believed that the more exposure someone had to works of art, the more their sense of appreciation developed. Popular professors, Santayana and Münsterberg immersed Harvard students year after year in a formalist aesthetic based on scientific psychology.49

Together, Ross and Dow offered a method of design education aimed at encouraging the students’ creative fac-

---

Figure 7  Denman Waldo Ross, A Theory of Pure Design (1907), figure 62, with an accompanying text that read: “Tangent down right 45˚, arc left radius 1” 60˚, arc right radius ¼” 90˚, arc left ¾” 180˚.”

Figure 8  Ross, A Theory of Pure Design, figure 203, depicting an exercise in shape harmony.
Figure 9  Reproduction of Sansovino’s library of St. Mark with a superimposed grid by C. P. Teigen, ca. 1915

Figure 10  Ross, A Theory of Pure Design, figure 231, depicting a demonstration of balance between line and tone

Figure 11  Ross, A Theory of Pure Design, figure 35, depicting an exercise that demonstrates how to counter a sense of movement
ulties. Although Ross’s reliance on science distinguished him from Dow, both conceived of design as a process rather than the conveyance of a skill and believed the faculties stimulated by the process would serve students in all aspects of life. As early as 1891 Dow wrote that “[a few simple principles] could serve us not only in making a picture but in building a house, in designing a costume or wall decoration, in the adornment of a street or the laying out of a public park.” Dow’s words had more portent than he might have realized. Art educators adopted Dow and Ross’s methods with enthusiasm; the generation of architects working in the 1920s and 1930s may therefore have learned Pure Design in elementary school. As a typical lesson plan for fifth- and sixth-year students from the popular art-education magazine *The School Arts Book* illustrates, American children grew up drawing and arranging abstract shapes (Figure 12).

By making the appreciation of art a formalist enterprise, Dow and Ross loosened the ties of Ruskinian moral associations in art. Their emphasis on the elements of design and universal principles made the details of historical styles, location, and cultural or social significance secondary considerations in the appreciation of aesthetic merit. Thus, while insisting upon a knowledge of the past, they nonetheless sidestepped training in the historical styles by emphasizing the perception of the art object’s formal characteristics—its harmony, balance, and rhythm. As Dow stated in 1909, “I believe the teaching of art by ‘styles’ and ‘periods’ to be fundamentally wrong. One who is trained in principles and has his appreciation developed can do anything in any style—innovate a style of his own.” A style of one’s own—these were appealing words to American architects interested in developing a modern architecture.

**Pure Design in Architectural Education**

In the 1890s, as Ross and Dow worked out their new methods, architects returned again and again to questions of curriculum. The committee on education at the American Institute of Architects’ annual convention in 1891 voiced...
the problem facing architectural educators with an almost palpable panic: “What shall be taught? What shall not be taught? What are the elements and principles which underlie the conglomerate mass of almost universal information required to be possessed by the successful architect?” The urge to get at some basic core remained consistent as architects continued to debate and experiment. Even before Lorch organized the session at the ALA in 1901, a handful of architects had become aware of Pure Design, and in the first decades of the twentieth century it continued to attract attention from both Beaux-Arts and Arts and Crafts sympathizers. Some Beaux-Arts trained architects may have recognized in Pure Design a similar emphasis on pedagogical method and principles; others may have recalled the psychological aesthetics of Hippolyte Taine, Charles Blanc, or Charles Henry. Arts and Crafts architects may have admired its emphasis on social reform, individual creativity, or correlation of geometry with nature and representation. The focus on creativity also addressed pressing questions introduced by new technologies, building types, and materials. Its resonance with architects of varied disposition lay in part in Pure Design’s echoing of familiar concerns; as one writer commented, “it is not a new theory nor a particularly new thought, but it has, we think, for the first time been clearly formulated into a practical proposition.”

Pure Design’s adaptable methods led to its inclusion in curriculums at Harvard and the University of Michigan, the work of their graduates and other interested architects, and design textbooks.

When H. Langford Warren started teaching architecture courses at Harvard in 1893, he hoped to construct a curriculum that might produce a modern American architecture. Like other educators, he turned to the Ecole des Beaux-Arts: it offered a method, regarded architecture as a fine art (rather than engineering), and established beauty as the goal. However, Warren argued, the Ecole had forsaken universal principles for formulaic laws, yielding either lifeless copies or a quest for novelty. Warren supplemented Ecole methods by drawing on both English and German authors for his courses, emphasizing cultural and historical events in his surveys and construction in both his history and design courses. Warren’s curriculum and writings demonstrate his attempt to achieve harmony between form and structure. Only by learning universal principles could the architect freely develop the new forms appropriate for new structures. After stating that a visual harmony of parts is not enough he continued: “It is a question of the poetic expression of the purpose, the structure, and the material in forms of beauty. The form must be felt by the trained sense to be in harmonious relation with the actual structure; that is, this structure must receive appropriate and harmonious and poetic expression in the form.”

This “trained sense” became a focus of Warren’s curriculum: “above all, [the student] is taught to seek beauty as the main aim of all that he does. . . . There is probably no part of the education of the prospective architect so important as the constant development of his sense of beauty, and this perhaps he gains quite as much by daily and hourly contact with the most beautiful works of past art as by instruction or the direct exercise of his own artistic faculties.” To encourage a sense of beauty, Warren directed students towards Santayana’s course in aesthetics and Münsterberg’s in psychology, and he hired Ross to teach design theory. Ross was not trained as an architect or a craftsman, and his theory of design had its basis in the two-dimensional art of painting, not architecture. However, Warren saw in Ross’s method a means to inculcate a sense of form through universal principles rather than by copying historical styles. Both Ross and Warren thought of beauty as an expression of order. Ross taught in the Department of Architecture from 1899 through 1909 and then in the Department of Fine Arts; in addition, from 1899 to 1914 he ran a summer program open to nonmatriculated students.

Ross taught Architecture 7: Theory of Design: Pure Design (Balance, Rhythm, and Harmony) and Design in Representation, a half-year course that met twice a week and attracted graduates and undergraduates from across the university. By 1905 Ross had fifty students. In the classroom, Ross supplemented the exercises in Pure Design with the Ross Study Series. The series included an array of items: books, photographs, quotations, color scales, and most importantly, original works of art that ranged from textiles to ceramics to paintings to sculpture. He might, for example, demonstrate “Harmony of Measure” with an Andean blanket and a Greek vase. He insisted on training the eye by studying originals. Thus, although his exercises avoided historical styles, he strongly advised students “to find out what has been done at different times and at different places in the history of Art. . . . It is a great mistake to ignore tradition and good precedents.” The books used by Ross reinforce his formalist approach: Bernard Berenson’s writings on the Renaissance, Jules Bourgoin’s *Theorie de l’Ornement* (1873), William Goodyear’s *Greek Refinements* (1912), Etienne J. Marey’s *Movement* (1895), Owen Jones’s *Grammar of Ornament* (1856), Fenollosa’s essays on Japanese architecture (1890s), and Van Brunt’s *Greek Lines* (1893). The variety of authors reminds us that Ross considered architecture as just one application of design principles in the fine arts. In his classes he avoided focusing attention solely upon architectural subjects. He aimed to strengthen the faculties
of appreciation more broadly: “We can compare the red of a painting with the red of a piece of porcelain, but to prefer pictures to porcelains is absurd. . . . The same principles of design which are followed in painting a picture are followed in making the cup or vase, and the only important question is, To what extent has the sense of beauty been expressed?”

Thus, the student work from his classes consists not of sketches for façades, the orders, or plans, but exercises and analyses of patterns and paintings depicting the principles of harmony, balance, and rhythm. For example, W. C. Titcomb, a student in 1903–4 and later an instructor at the University of Michigan, submitted a motif for use in a repeating pattern complete with color sequence (Figure 13). Courtlandt Van Brunt (Henry’s son) produced a balcony railing that had harmony of shape and interval (Figure 14). John Nolen, the future city planner, took Ross’s course while a graduate student in the Landscape Architecture Program in 1903–4; he submitted an exercise in tone relations (Figure 15). Kenneth Conant used a geometrical grid to analyze the compositional harmony of Rubens’s *Abduction of the Daughters of Lycippus* (Figure 16). William Sumner Appleton, later the founder of the Society for the Preservation of New England Antiquities, received a B+ for his exercise in tone synthesis (Figure 17).

Ross’s approach did not remain anomalous for the students. His teaching reinforced the emphasis on visual perception and form in courses taught by Santayana and Münsterberg. Within the Architecture Department, a num-
Figure 16  Kenneth Conant, student exercise analyzing compositional harmony submitted to Ross, ca. 1915

Figure 17  William Sumner Appleton, student exercise in tone synthesis submitted to Ross, 1907
ber of instructors had a familiarity with Ross’s methods. The artist Hermann D. Murphy, who attended Ross’s summer course in 1900 (he also knew Dow’s work), often taught a class called Drawing from Life. Similarly, the instructor Walter Dana Swan took Ross’s summer course in 1899. Ross’s friend, the artist Joseph Lindon Smith, taught Free-hand Drawing. William Mowll, an instructor in architectural design, coauthored Ross’s summer course in Pure Design in 1904 and 1906 and later coauthored with Charles Fabens Kelley *A Text-book of Design* (1912). Arthur Pope, a student of Ross’s, soon joined the faculty, taught Free Hand Drawing, and eventually coauthored Architecture 7. All of these courses, in conjunction with those offered by Santayana and Münterberg, suggest that Warren devised an innovative curriculum to encourage the students’ sense of form.

**Emil Lorch**

Emil Lorch (1870–1963) was one of Ross’s most influential students. A pragmatic man, Lorch argued for a balance in education between aesthetics and construction. With a strong background in art education, he immediately saw in Pure Design a practical means to heighten aesthetic sensibility. He worked ceaselessly from the turn of the century to the end of his career to convince architects of its potential.

In 1899, Lorch started teaching at the Art Institute of Chicago. A number of scholars have already suggested that Chicago architects, including Frank Lloyd Wright, were familiar with Ross and Dow’s work. Lorch’s interest in Pure Design has significance because he perceived its potential for architectural education at an institutional rather than individual level. For Lorch, Pure Design held the answer to the questions concerning American architecture posed by Louis Sullivan. In “The Young Man in Architecture,” Sullivan spoke of the need for organized thinking, the avoidance of originality, the “stimulation of the mind,” rhythm, and balance. Lorch made his case for Pure Design in a 1901 letter to Arthur Rogers, the editor of *The Brickbuilder*:

> While here in Chicago and elsewhere many persons have for a long time been favoring a change of architectural design study methods none of these persons have made a practical suggestion— one that could be put into force or operation in a pedagogical or teaching sense, for bettering those much-berated methods of instruction. The Chicago School of Architecture for a long time received no such practical suggestion and help. The proposition of using methods of study employed in the decorative and fine art field came, as is here known, from me, and logically would have come from someone acquainted with the wider art educational field unfettered by a ‘specific application’. . . . This ‘Pure Design’ as is shown too concisely in my paper is succeeded—or out of it grows—organic or ‘applied’ design to more fully develop the conceptive sense of the student.

Lorch wrote the letter because Rogers had omitted the paper he refers to from publication in *The Brickbuilder*.

The slighted paper had served as Lorch’s calling card for Pure Design at the Chicago Architectural Club (CAC) and ALA. He presented this paper—titled “How Can Pure Design Best Be Studied?”—at the March 1901 meeting of the CAC. Robert C. Spencer Jr. followed with “Should Architectural Design and the Study of Historic Styles Follow and Be Based Upon a Knowledge of Pure Design?” Both papers emphasized the characteristics of Pure Design already noted: they focused on universal principles, the creative faculties of the student, and the intelligent use of historical styles rather than drilling in the orders; Lorch noted that the audience included Frank Lloyd Wright.

At the Art Institute, Lorch used Pure Design in his courses. He acknowledged that he had imported art methods into architectural education because in his mind, a sense of composition remained common to both. “Through pure and applied design then, I believe the young student will most easily and most quickly develop an appreciation of composition or arrangement, and be better prepared for the study of architecture.” Lorch’s tenure at the institute did not last long however. Dismissed in May 1901, he left for Harvard to study with Ross, Santayana, and Münsterberg.

Finishing at Harvard in 1903, Lorch taught at Drexel Institute (now University) in Philadelphia, where he had the freedom to use Pure Design as a regular part of his teaching. He developed a strong following among the students, and his enthusiasm drew other faculty to investigate Pure Design. Dean Arthur Truscott attended Ross’s summer course in 1905; Alice Morse, who taught both at Drexel and at the School of Design for Women, took Ross’s course three times. Lorch left Drexel in 1906 to chair the newly reestablished Department of Architecture at the University of Michigan.

At Michigan, Lorch made Pure Design the foundation course for all programs within the department. Like Warren, he viewed it as a preliminary course separate from the design studios. This class, titled Elements of Design, introduced students to Pure Design in the first semester of their first year. Only after taking this course could a student register for Architectural Design I. As the department grew, Lorch went out of his way to hire faculty familiar with Pure Design: Titcomb, Raymond Everett, Charles Dana Loomis, and Fiske Kimball had all studied at Harvard. Students also used Pure
Design methods in architectural history courses to grasp the universal principles of design in the monuments depicted.\textsuperscript{71}

Lorch's use of Pure Design continued to attract attention both nationally and internationally. As a founding member of the Association of Collegiate Schools of Architecture (ACSA) in 1912, he brought Pure Design to the attention of other educators and had a fundamental role in drafting the ACSAs “Standard Minima” for architecture programs, which included room for courses in theory and design elements.\textsuperscript{72}

In 1922, Robert Atkinson, the director of Education at the Architectural Association in London and author of a report for the Royal Institute of British Architects (RIBA) on American schools of architecture, described the Michigan curriculum in terms usually associated with the Bauhaus: “Professor Lorch is very keen on modern design, and begins his students very early upon pure abstract design as an exercise in ingenuity and observation, such as pure form in the shape of arrangement of black dots and lines (mosaics etc.), the shapes, as squares, hollow and solid, triangles, circles and combinations of these, then diaper repeats of simple form, next colour and colour harmony, and finally colour schemes.”\textsuperscript{73} By 1922 when Atkinson wrote, Lorch's department had 186 students.

The Dissemination of Pure Design

With footholds at Harvard and Michigan, Pure Design steadily diffused its formalist aesthetic. Graduates, faculty, and authors took Pure Design to other institutions or incorporated it in their work and publications.

Ross’s summer course at Harvard served as one important conduit. Open to nonmatriculated participants, it frequently drew more than eighty students each summer, including instructors from architecture, art, and design departments at Drexel, Cornell University, Syracuse University, the University of Toronto, the University of Pennsylvania, the Art Institute of Chicago, the Maryland Institute of Design, Columbia University, and the University of Wisconsin. Ross’s students headed the Department of Decorative Design at the Rhode Island School of Design (RISD) from 1902 to 1937; his methods so thoroughly imbued department pedagogy that, in 1927, a new president wishing to make changes adopted the slogan “from Ross to the Bau Haus.”\textsuperscript{74} Educators identified with the Arts and Crafts movement included Mary Given Sheerer, her colleagues from Newcomb College, and the California ceramicist Ernest Batchelder, who taught at Throop Polytechnic. Batchelder studied with Ross for two summers and made Pure Design the basis for his book *Principles of Design* (1904). Published three years before Ross's own book, it brought Pure Design to a West Coast audience.\textsuperscript{75}

As the summer course participants took Pure Design into their work and institutions, so did the graduates of Harvard and Michigan. John Nolen took the time to type out all of his notes from Ross’s class.\textsuperscript{76} Maynard Johnson, a 1928 Michigan graduate, recalled, “I really believe it was important that Michigan was not part of that system [the Beaux-Arts]. . . . [W]e were encouraged to be exploratory, innovative rather than follow the current fashion in architectural design. This doesn’t mean we were not influenced by the B.A. projects we saw that were published. At least I felt our school meant a great freedom.”\textsuperscript{77} Rudolph Weaver had Lorch as an instructor at Drexel in 1903, and he also attended Harvard. In 1925 Weaver established the architecture program at the University of Florida, which quickly gained a reputation for innovative teaching. After Weaver's death in 1944, Lorch wrote that “something of [Ross and Dow's] teaching entered into Rudolph Weaver's approach later to modify the over-traditionalism of the period as a whole.”\textsuperscript{78}

Fiske Kimball, educator, scholar, museum director, was one of the most significant figures in the second generation of Pure Design; linked both to Harvard and Michigan, Ross and Lorch, Kimball merged their formalist aesthetic with the Beaux-Arts tradition he favored. At Harvard, Kimball took Santayana’s course on aesthetics (for which he later served as an assistant), studied with Ross, and became enamored of scientific history (Ross’s own starting point). In an unpublished account of his years at Harvard, “Harvard in Transition,” Kimball claimed Ross’s principles had no philosophical validity and dismissed *A Theory of Pure Design* as too rigid; but he valued Ross’s aesthetic judgment: “The strength of Denman Ross was not his principles but his taste as a collector. In the school of architecture was a room with objects chosen as examples of his system [the Ross Study Series], objects which far surpassed it.”\textsuperscript{79} Kimball continued to read Ross’s writings after leaving Harvard. While he rejected the method he remained keenly aware of the goal: that beauty remained the end of art, that it was appreciated in the formal achievements of a work, and that the eye trained itself by direct observation of the arts. Kimball’s assimilation of formal appreciation reveals the greater legacy of Ross’s teaching. In an undated manuscript outline titled “The Appreciation of Architecture,” Kimball began with “Beauty” and Ross’s triad of attributes—harmony, balance, and rhythm. Later, claiming that beauty only appears in “orderly works,” he stressed a rational rather than sensuous understanding of beauty: “All elements of organic beauty act on the mind rather than on the senses.”\textsuperscript{80} In 1913 he outlined along similar lines another book—‘The Enjoyment of Architecture: A Discussion of the Aims and Prob-
lens of Architecture with a View to Stimulating Appreciation.” But Kimball never wrote the book; instead he began teaching at the University of Michigan, a position he obtained because of his knowledge of Pure Design.

At Michigan, Lorch assigned Kimball the Elements of Design course, which he taught from 1913 to 1916 while writing Thomas Jefferson, Architect. In 1919, Kimball left Michigan for the University of Virginia to head the newly founded School of Fine Arts. In the curriculum for the architecture program, he did not install an equivalent course to Elements of Design. However, he copied what he thought Ross had done best at Harvard: he surrounded the students with great works of art, relying on the campus with its buildings by Jefferson and Stanford White, its sculpture by Houdon, Borglum, and Keck, and through exhibitions of paintings he arranged with the American Federation of Arts. Direct exposure to these works encouraged the architecture students’ appreciation of form, color, material, and composition. In his history courses he drew attention to the formal solutions and visual effects of past works that might aid contemporary design. Kimball’s formal emphasis did not come entirely at the expense of construction. In a move that might have surprised Lorch, Kimball made three courses in construction a mandatory requirement of the program. Nonetheless, he expected the formal sensibility to guide technical knowledge. In a letter to Atkinson, Kimball offered an insightful summary of the American attitude to form and function:

The present tendency in American architecture itself, it seems to me, is strongly away from the technical, and away from the expression of structure, in the direction of abstract form. . . . [The] tendency is not consciously confessed by its adherents, even to themselves; they preach the expression of use and structure, while ignoring it in practice. . . . It is heresy to say this, and I am not shouting it from the housetops here, but in my own school I am frankly trying to teach how to achieve results in the realm of abstract architectural form—portions, masses, and interior spaces. . . . Of course, we want to make use of all the achievements of modern constructive science, and make our buildings just as convenient and, indeed, just as expressive as possible, but one should not necessarily insist on ‘constructing first, without preoccupation with the final appearance, promising oneself to utilize the ingeniousness of the construction as the decoration’! If I were to say this in America I should be hung up by the thumbs for it.  

This letter reveals Kimball’s formal approach to architectural education and identifies the American hesitation to abandon the aesthetic for function. Kimball’s exposure to Pure Design can help explain his assessment. Certainly his own heightened sense of form and trained eye underpinned his historical and critical writings. Taking his chances at being “hung up by the thumbs,” Kimball pursued his formalist argument in publications such as American Architecture (1928). Pure Design attracted other Beaux-Arts supporters. Alexander Trowbridge, briefly a partner of Albert Kahn and subsequently on the faculty at Cornell, wrote a lively defense of Beaux-Arts methods in architectural education in 1900, and attended Ross’s course that same summer. John Carrère owned A Theory of Pure Design and in his 1908 pamphlet, City Improvement from the Artistic Standpoint, he quoted Ross’s definition of beauty in its entirety. The well-known renderer Harold Van Buren Magonigle, trained in the office of McKim, Mead and White, relied on Ross’s work in color theory for his own popular book Architectural Rendering in Wash (1921; reprinted five times through 1936). Like Ross, Magonigle wanted to improve technique by providing a method that trained the eye. He wrote, “why so much emphasis upon draughtsmanship, upon presentation? Because by means of drawings the eye is trained to appreciate values in the distribution of light and shade and color—and it is with light and shade and color the architect deals all his life.” Magonigle’s book also demonstrates how appreciation depended less on historical accuracy than on form. For the frontispiece he used a rendering by Jules Guerin of McKim, Mead and White’s library at Columbia University; under it he wrote: “Mr. McKim said of Jules Guerin that he could show less and express more than anyone he knew. This drawing is an admirable example of the suppression of detail in favor of structural mass.” Magonigle’s statement recalls Dow’s reference to the rectangles of the Boston Public Library. For Dow and Ross, and now for Magonigle, appreciation rested upon formal composition and not the particular stylistic details employed.

Other textbooks relied on Ross or Dow’s work. Batchelder’s Principles of Design has already been mentioned. In 1912, Mowll, who briefly taught with Ross at Harvard, coauthored A Text-book of Design with Kelley (who taught at the University of Illinois). The introduction acknowledged that “the theory of pure design now generally accepted is presented with but a few minor points of difference.” The authors discuss design elements and examples similar to Ross and Dow’s (like Dow, they paired the abstract exercises with works of art; Figures 18, 19). Recalling Lorch, Mowll and Kelley emphasize the use of theory for practice: “Each step in theory has been correlated with the practical side of the question and no point has been
dwelt upon that is not met constantly in the practice of design." The attempt to unite formal considerations with practice also appears in De Garmo and Winslow’s popular textbook *Essentials of Design* (1924; reprinted five times by 1927). In reference to architecture they wrote: “Study the houses that you pass on the street for examples of unsymmetrical balance produced by varying sizes and placing of windows and door openings or by irregularities in the roof line. It is partly in the need for this kind of balance that architecture is generally included among the ‘fine arts’.”

Textbooks like these demonstrate yet another means by which Americans gained a familiarity with formalist pedagogical methods in the early twentieth century.

Finally, Pure Design should also be considered in relation to the widespread interest in geometry at the turn of the century. Both Ross and Dow relied on geometrical divisions of space to provide the sense of order in the design. Ross established friendships with two other theorists, Hardesty
Maratta and Jay Hambidge. Maratta had developed the “Web of Equilateral Triangles” for artists and draftsmen: a preprinted sheet with a grid of triangles that could be placed under tracing paper to guide the designer creating a composition, or over a reproduction of a work of art to demonstrate a proportional composition (see Figure 9). Hambidge believed he had rediscovered the system of proportion used by the fifth-century Greeks that could now aid contemporary designers. Termed “Dynamic symmetry,” his system relied on root rectangles and “whirling squares” to generate proportionate areas. Like Dow’s line-ideas, the squares brought order to the division of space; and like Ross, Hambidge gave the divisions a mathematical foundation. Ross worked with Hambidge in the late 1910s; Ross’s own sense of order led him to devise a more simplified system, which he used in his classes and own work through the 1920s.

The geometrical schemes in Ross and Hambidge’s work provided a system for understanding design, not a style, and made geometry attractive to both historians and designers. Lacey D. Caskey and Gisela Richter applied it to their studies of Greek art and Irma Richter to modern art; architects and designers such as Claude Bragdon and Wal-
ter D. Teague used it in their own work. The belief that geometry benefited both scholarship and practice had important repercussions for design in the twentieth century. Not surprisingly, Wittkower drew attention to the connection between Hambidge’s historical research and relevance for contemporary design: in “The Changing Concept of Proportion” (1960), he suggested that Hambidge “bridged the gap” between ancient and modern art; in his discussion of dynamic symmetry, he also mentioned Ross.

The incorporation of Pure Design into architectural education demonstrates a shift toward an aesthetic of form. Initially supported by educators eager to end the battle of the styles, Pure Design’s abstraction equally lent itself to those who supported the ascendancy of high modernism. Joseph Hudnut, the man who brought Walter Gropius to Harvard, had studied at both Harvard and Michigan; his conviction that creativity-heightening pedagogical methods could coexist with knowledge of the historical styles never wavered. Hudnut’s colleague at Harvard, landscape architect Christopher Tunnard, cited Ross’s book in his manifesto Gardens in the Modern Landscape (1938); Henry-Russell Hitchcock, the historian who articulated modernism’s formal qualities so precisely, excelled in the course on Pure Design as a Harvard undergraduate.

The presence of Pure Design earlier in the century suggests how American architects and educators first engaged a formalist aesthetic and what they hoped to gain. In the years around 1900, Pure Design appealed widely because it promoted a way of thinking about design, not a particular style, not even a particular medium. It offered a method for cultivating the appreciation of form; the exercises advocated by Dow and Ross strengthened the students’ conceptual sense of a composition’s unity, which, architectural educators believed, would allow them to draw freely and intelligently from history and technology. Dow and Ross’s emphasis on visual perception and compositional order and their synthesis of contemporary psychology, philosophy, and art education shaped the intellectual and cultural context within which American architects pursued a modern architecture.

Notes
1. “Study of Pure Design in Architectural Education,” Inland Architect and News Record 37, no. 5 (June 1901), 33–39. The Inland Architect printed Lorch and Spencer’s papers in full, Ross and Dow’s letters of support for the session, and a selection of responses prepared for the panel discussion. Selected additional contributions were also published in The Brickbuilder 10, no. 6 (June 1901), 112–23. Bragdon wrote to Lorch after the convention: “It’s scarcely necessary to tell you that I am in thorough sympathy with your aims and endeavors. . . . You will be interested to learn that Miss Stowell and Harvey Ellis here in Rochester are teaching enthusiastic classes on very similar lines, and that these ideas are gaining ground and seem to me bound to prevail—principally because they are sound and true.” Claude Bragdon to Emil Lorch, 26 June 1901, Lorch Papers, box 1–9, Bentley Historical Library, University of Michigan, Ann Arbor.

2. Before 1890 there were five academic programs in architecture (Massachusetts Institute of Technology [MIT] in 1865 followed by Cornell, Illinois, Syracuse, and Columbia); in the 1890s alone that number more than doubled, and after 1904, barely a year went by without the establishment of at least one additional program. See Arthur Weatherhead, The History of Collegiate Education in Architecture in the United States (Los Angeles, 1941), 235–37. Mary Woods underscores the correlation of education with the status of the profession at the end of the nineteenth century in From Craft to Profession: The Practice of Architecture in Nineteenth–Century America (Berkeley, 1999), 53–81. See also Burton Bledstein, The Culture of Professionalism: The Middle Class and the Development of Higher Education in America (New York, 1976).

3. For the decline of Ruskin’s influence with respect to Hegel and science, see Roger B. Stein, John Ruskin and Aesthetic Thought in America 1840–1900 (Cambridge, Mass., 1967); and William Goetzmann, ed., The American Hegelians: An Intellectual Episode in the History of Western America (New York, 1973). For the use of science to legitimize other professions, see Samuel Halber, The Quest for Honor and Authority in the Professions (Chicago, 1991). On psychology, see Kurt Danziger, Constructing the Subject: Historical Origins of Psychological Research (New York, 1990). William James and John Dewey used psychology to challenge the ascendancy of Hegelian idealism—their efforts resulted in greater attention to the unmediated experience between object and observer. For a more general account of the shift in American attitudes after the Civil War, see Louis Menand, The Metaphysical Club (New York, 2001); and Robert Wiebe, The Search for Order, 1877–1920 (1967; Westport, Conn., 1980). Thomas Kuhn’s concept of the paradigm shift, although overused, can remain helpful here since science served as one of the “agents of change.”

4. Ruskin’s “most important and lasting contribution was his pioneering of a totally new direction for art education, one wedded to the rules of neither art academies nor industrial design; rather, he situated it within the liberal arts. Ruskin’s legacy lives today in the fact that most colleges offer some form of art appreciation in their basic curricula.” Arthur Efland, A History of Art Education (New York, 1990), 147. See the parallel argument made for Charles Eliot Norton, Ruskin’s American advocate, in James Turner, The Liberal Education of Charles Eliot Norton (Baltimore, 1999), 262.


6. See for example, Charles Caffin’s How to Study Pictures. . . . (New York, 1905) and How to Study Architecture (New York, 1917), John Van Dyke’s numerous publications including How to Judge of a Picture (New York, 1889), or Frank Wallace’s How to Know Architecture (New York, 1910). There are many other examples—Sturgis wrote companion volumes on sculpture and painting. On Sturgis, see Karin Alexis, “Russell Sturgis: A Search for the Modern Aesthetic—Going Beyond Ruskin,” Atlantic 3 (1983–84), 31–39. In addition, the writings of George Lansing Raymond, John W. Stimson, and Henry Rutgers Marshall addressed architectural appreciation on a more philosophical and psychological level.

in which he claimed that Americans would only develop an architecture of their own once they understood the value of a line. Van Brunt, “Greek Lines,” *Atlantic Monthly* 7 and 8 (June and July 1861), 654–67 and 76–88, rpt. in Van Brunt, *Greek Lines and Other Architectural Essays* (Boston, 1893). William Coles notes that “Van Brunt and his contemporaries never fully understood that their continued preoccupation with theory signified an increasing tendency toward abstraction in architectural thought,” and further that Van Brunt’s writings encouraged formal analysis; see Coles, ed., *Architecture and Society: Selected Essays of Henry Van Brunt* (Cambridge, Mass., 1969), 71.


9. J. W. Case, “Architectural Education,” *Inland Architect and News Record* 37, no. 5 (June 1901), 38. Defining the advantages of an academic education occupied many educators. Only in the twentieth century did academic programs become the preferred means of architectural education; as Turpin Bannister points out, few nineteenth-century architects enrolled in the available schools: “In 1898 . . . nine schools together enrolled only 362 regular students. . . . During their first three decades, the schools had as yet trained only a small fraction of the 10,581 architects reported by the 1900 Census.” Bannister, *The Architect at Mid-Century: Evolution and Achievement* (New York, 1954), 98.

10. The history of architectural education for this period tends to focus on studies of individual programs or the careers of individual architects. These studies have provided invaluable material that discloses how founders or faculty strove to adapt Ecole des Beaux-Arts and German polytechnic methods or Arts and Crafts ideals to their own goals for American architecture. See for example Maureen Meister, *Architecture and the Arts and Crafts Movement in Boston: Harvard’s H. Langford Warren* (Hanover, N.H., 2003); Jeffrey Karl Ochsner, Lionel H. Pries: Artist, Educator—From Arts and Crafts to Modern Architecture (Seattle, 2003); and Gwendoleny Wright and Janet Parks, eds., *History of History in American Schools of Architecture, 1865–1975* (Princeton, 1990).


15. Throughout the nineteenth century educators had urged drawing as a means to develop the cognitive and creative faculties of a child. For general histories of American art education and the contributions of Dow or Ross, see Efland, *History of Art Education*; Stuart MacDonald, *The History and Philosophy of Art Education* (New York, 1970); and Peter Smith, *History of American Art Education* (Westport, Conn. 1996), who singles out Dow as the force behind a formalist methodology. Foster Wygant writes that “the most excitement [in art education] in the first two decades of the century was inspired by the teaching of two men [Dow and Ross] who showed how all art could be understood and taught through universal principles of design.” Wygant, *School Art in American Culture, 1820–1970* (Cincinnati, 1993), 26.


17. Fenollosa studied philosophy at Harvard where he gained an admiration for Hegel and Herbert Spencer’s Social Darwinism; he relied on this intellectual foundation as he developed his ideas on art. When he moved to Japan in 1878 he became fascinated with the “synthesis” artists achieved between the subject and the formal composition and the way the Japanese incorporated art into everyday life. Fenollosa soon became the leading American authority on Asian art; when he returned to the United States in 1890 to head the Oriental Department at the MFA, he decided to use that knowledge not to further antiquarian studies about Asia but to improve American life through reform in art education. For biographical accounts of Fenollosa, see Van Wyck Brooks, *Fenollosa and His Circle: With Essays and Biography* (New York, 1962); Lawrence Chisolm, *Fenollosa: The Far East and American Culture* (New Haven, 1963); and most recently, Yutaka Ito, “‘Words Quite Fail!’: The Life and Thought of Ernest Francisco Fenollosa” (PhD diss., Rutgers University, 2002). I would like to acknowledge this dissertation for bringing certain writings by Fenollosa to my attention. On Hegel and Social Darwinism more generally, see Goetzmann, *The American Hegelians* (see n. 3); and Richard Hofstadter, *Social Darwinism in American Thought* (1944; Boston, 1992).


21. In 1897, Dow provided illustrative material for John Spencer Clark’s textbook, *The Prang Elementary Course in Art Instruction* (Boston, 1897); following Composition, Dow published *The Theory and Practice of Art Education*...
(New York, 1908), but this book never superseded Composition in popularity. In 1913, Dow revised the 1899 text and changed the title to Composition: A Series of Exercises in Art Structure For the Use of Students and Teachers. The most recent reprint (University of California Press, 1997) uses Dow's revised edition of 1913. See the introduction, which provides the publication history of Composition on pp. 18–25.

22. Dow's emphasis, quoted in Johnson, Arthur Wesley Dow, 61. For additional criticisms of academic methods by Dow, see his Theory and Practice, 2–3. In undated lecture notes he wrote under the heading “Appreciation”: “It is possible to know much about art, and yet to have no real experience of art—to have no deep love or sympathy, to be without feeling. So it is possible to join the ranks of artists—to learn to draw and to model, and yet never be creative, never get beyond an intellectual expression. The academic art schools produce this type of cold intellectual art.” Archives of American Art, Arthur Wesley Dow Papers (hereafter AAA, AWD Papers), Washington, D.C., microfilm #1033.

23. Dow, Composition, 6. Dow continued: “It is not my intention to furnish a book from which art may be taught, but to offer a principle by which an instructor can be guided.” Both Dow and Ross admired Walter Crane, whose Bases of Design appeared in 1898.

24. Dow, Composition, 80.


26. Dow, Composition, 16.

27. “Abstract design is, as it were, the primer of painting, in which principles of Composition appear in a clear and definite form. In the picture they are not so obvious, being found in complex interrelations and concealed under detail.” Dow, Composition, 24.

28. Dow, “Lesson 5,” p. 6, ca. 1895, AAA, AWD Papers, microfilm #1033. In Theory and Practice, 29, Dow wrote: “effort is made to show throughout the series [the history of art] that all space-art, whether pattern or building, statue or picture, is based upon identical elements, there being only a difference in the degree of harmony.”

29. Dow, Composition, 37. Dow made the break with the Ruskinian tradition even stronger in a later lecture: “It is not the first purpose of a work of fine art to convey information or to teach a lesson in history or morals or science. It is not the main purpose of a work of fine art to tell the truth. . . . A picture may not be true to nature, and yet be fine art.” Arthur Wesley Dow, “Notes—Board of Education, Nov. 8, 1905,” Arthur Wesley Dow Papers (hereafter AWD Papers, Ipswich), Ipswich Historical Society, Ipswich, Mass.

30. Dow, lecture notes, 26 Feb. 1906, AAA, AWD Papers, microfilm #1033; emphasis in original.


32. Dow, Theory and Practice, 4. In Composition he wrote: “historic ornament can be used for its own inherent beauty, not for the study of a style.”

33. A spiritual person by inclination, Dow’s understanding of universal principles allowed inexplicability: “Mythology has an important place in art, and my ambition is to paint natural objects and to throw over them the air of poetry and mystery that they have.” Quoted in Johnson, Arthur Wesley Dow, 27 (see n. 12). For Dow’s influence on other artists who shared this view, see Elizabeth Chew, Fenollosa, Dow, Tack and Phillips: A Case for ‘Subjective’ Painting in America, in Augustus Vincent Tack: Landscape of the Spirit, ed. Leslie Furth (Washington, D.C., 1993), 67–73.

34. Denman Waldo Ross, A Theory of Pure Design: Harmony, Balance, Rhythm With Illustrations and Diagrams (hereafter ATPD; Boston, 1907), vi. For more on the differences between Ross and Dow, see Mary Ann Stanek.
mental sensation; Helmholtz's *Handbuch der physiologischen Optik* (Leipzig, 1867) provided physiological explanations for the perception of color or shape. The correlation of physical and mental activity suggested by these publications served as the basis for the new field of physiological psychology, which gained direction and renown through the work of Wilhelm Wundt when he authored the *Grundzüge der physiologischen Psychologie* in 1874. Wundt took scientific psychology a step further by combining the existing emphasis on mathematics and physiology with science's experimental methods—he opened the first laboratory for psychological experimentation in 1879. Here he conducted experiments on sensation and perception that he could measure, so that the results had the certainty of mathematics, which could in turn establish laws of the mind. For discussions of scientific psychology, physiological psychology, the debt to Kantian aesthetics, and Wundt, see Danziger, *Constructing the Subject*, chaps. 2, 3 (see n. 3); Daniel N. Robinson, *An Intellectual History Of Psychology* (New York, 1981), 342 ff.; Robinson, *Toward a Science of Human Nature: Essays on the Psychology of Mill, Hegel, Wundt and James* (New York, 1982); Bruce Kucklick, *The Rise of American Philosophy* (New Haven, 1977), 180 ff.; Michael Heidelberger, “Gustav Theodor Fechner,” in *Statistics of the Centuries*, ed. C. C. Heyde and Eugene Seneta (New York, 2001); David K. Robinson, “Reaction-time Experiments in Wundt’s Institute and Beyond,” in *Wilhelm Wundt in History: The Making of A Scientific Psychology*, ed. Robert Rieber and Robinson (New York, 2001), 161–204; the dated but still essential Edwin Boring, *A History of Experimental Psychology* (New York, 1929); and Boring, *Sensation and Perception in the History of Experimental Psychology* (New York, 1942).

44. Ross’s use of scientific psychology remains intriguing because he relied on the same body of knowledge that had a direct impact on German aesthetics and design; see Harry Mallgrave and Eleftherios Ikonomou, *Constructing the Subject* (Cambridge, Mass., 1997), 113–37. See also the related discussion in Menand, *The Education of the Architect*, ed. Martha Pollak (Cambridge, Mass., 1997), 4–6. Menand pointed out, many Americans had a tendency to forego “the exhaustive contemplations often overshadowed the emphasis on method. As critic Charles Caf- fin pointed out, many Americans had a tendency to forego “the exhaustive training in the direction of independent reasoning that it is the [École des Beaux-Arts’s] purpose to impart” and simply become “more or less intelli- gents; see for example, Paul Cret, “The École des Beaux-Arts: What its Archi- tectural Teaching Means,” *Architectural Record* 23 (May 1908), 367–71. For the Beaux-Arts and the psychological effect of form, see Christopher Mead, *Charles Garnier’s Paris Opera* (Cambridge, Mass., 1991), 253 ff. For Henry,
see José Argüelles, Charles Henry and the Formation of a Psycho-physical Aesthetic (Chicago, 1972).

56. “Study of Pure Design in Architectural Education,” 34 (see n. 1).

57. H. Langford Warren, “The Influence of France Upon American Architecture,” American Architect and Building News LXVI, no. 1248 (25 Sept. 1899), 67–68. Ross also criticized the Ecole: “It is admitted that the academic practice established by the École des Beaux-Arts is still followed in some of the schools where everybody does the same thing in the same way for three, four, or five years and going on afterwards as teachers teaching the pupils to do it again in the same way.” Typescript essay, n.d., Denman Waldo Ross Papers, file: “Misc. MS Probably Copied,” box 38, Harvard University Art Museums, Cambridge, Mass.

58. See Meister, Architecture and the Arts and Crafts Movement (see n. 10); and Anthony Alofsin, The Struggle for Modernism: Architecture, Landscape Architecture, and City Planning at Harvard (New York, 2002); the bibliography contains citations to earlier valuable articles by Alofsin on Warren.

59. H. Langford Warren, The Foundations of Classical Architecture (New York, 1919), 159. He continues: “The sense of the appropriate and harmonious relationship of all the parts to the whole, and of the whole to its essential purpose and environment—this it is that produces the impression of beauty in the work of art, as in nature. Beauty is the perfect expression of nature’s laws of order.”


61. In 1909 Ross lengthened the course to two-semesters; Arthur Pope taught the first semester and Ross taught the second. For course enrollments, see “Final Returns,” HUA (see n. 39). Ross belonged to the Boston Architectural Club, the Boston Society of Architects, and the Boston Society of Arts and Crafts.

62. Denman Waldo Ross, typescript essay, “On the Practice of Drawing and Painting,” n.d., Denman Waldo Ross Papers, box 38, Harvard University Museum Archives. Ross wrote: “The beauty and the value of the object are discovered by comparing it with other objects of the same kind. It is the eye of course, that tells us what is better and what is best. To know the best of its kind we must have seen it. The best is then our standard of enjoyment.” Ross, “Exhibition of Additions to the Ross Collection,” Museum of Fine Arts Bulletin XI, no. 67 (Dec. 1913), 75.

63. Ross, “Exhibition,” 75.

64. See the annual Harvard University Catalogue, HUA, for listings of the faculty and of Ross’s summer school students. For further connections between Murphy, Ross, and Dow, see Green and Poesch, Arthur Wesley Dow, 85, no. 36 (see n. 12). For Pope’s assimilation of Ross’s teaching, see Arthur Pope, Language of Drawing and Painting (Cambridge, Mass., 1929).


67. Emil Lorch to Arthur Rogers, 21 June 1901, box 1-9, Lorch Papers (see n. 1); emphasis in original.

68. Published versions of the papers appeared in The Inland Architect and News Record XXXVII, no. 5 (June 1901). In “Should the Study of Architectural Design and the Historic Styles Follow and Be Based Upon a Knowledge of Pure Design?” Spencer wrote: “The study of pure design as a means of strengthening creative power, of developing an appreciation and understanding of the principles of line, form and color, of light and shade, rhythm, balance, organization should be made an important and primary feature of every school of architecture. Of its value as an individual I have the most direct personal knowledge.” 34. In “Some Considerations Upon the Study of Architectural Design,” Lorch wrote, “how best to prepare [the] student that he may build beautifully as well as soundly. . . . [How] to make him not an adaptive but a creative worker. . . . [Should] not this be the highest and ideal end of architectural design study? My belief is that this end can be most nearly attained by exercises in pure design. . . . [In] order to develop as much as possible the student’s perceptive power, his appreciation of the beauty of line, form, and color, and the necessity of harmonious inter-relation between these to produce beauty, leaving the study of historic forms to a later period in his course.” 34, emphasis in original. See also Emil Lorch, “A New Departure in the Study of Architectural Design,” Brush & Pencil 8, no. 5 (Aug. 1901), 258. For Wright’s presence during the lecture, see Lorch to Rogers, 21 June 1901, box 1-9, Lorch Papers.

69. Lorch, “New Departure,” 262. While at the institute, Lorch wrote to Ross: “I started the students on “Elements of Design,” as I call it—which is of course based on and largely identical with your ‘work’ in theory and practice.” Lorch to Ross, 12 Nov. 1907, box 1-7, Lorch Papers.

70. For a general account of Lorch’s presence at Drexel, see Edward McDonald and Edward Hinton, Drexel Institute of Technology 1891–1941: A Memorial History (Philadelphia, 1942), 123. Truscott took the summer course in 1903; Morse took the course in 1903, 1904, and 1905; Mary Brown, another instructor, took it in 1906. Harvard Course Catalogue, HUA.


74. All summer course attendees are listed annually in the Harvard University Catalogue. At RISD, faculty members Henry Hunt Clark, William Brigham, Edmund Gurley, and Jessie Burbank all studied with Ross. See RISD annual catalogs and John Frazier, “An Inquiry into Causes that Brought Changes in Curricula and Educational Standards at RISD,” 13 Nov. 1953, John R. Frazier Speeches and Writings, ca. 1948–62, Rhode Island School of Design Archives, Providence, R.I.

75. Ross’s summer course also became a haven for Arts and Crafts artisans. Both Ross and Dow developed a loyal following within the Arts and Crafts movement. On Dow, see Green and Poesch, Arthur Wesley Dow (see n. 12); and Marilee Meyer, “Arthur Wesley Dow and His Influence on Arts and Crafts,” in Arthur Wesley Dow: His Art and His Influence (New York, 1999), 44–75. On Ross, see Marilee Meyer, Inspiring Reform: Boston’s Arts and Crafts Movement (New York, 1997); and Nancy Green, ed., Byrdcliffe: An American Arts and Crafts Colony (Ithaca, 2004). Ross lamented the lack of mental discipline in much Arts and Crafts work; see Ross, “The Arts and Crafts: A
for (1921; VII, no. 2 (Apr. 1913), 87. One caveat needs mention: although 18 (Oct. 2007).


ditional and historic one. Lethaby in his recent essay puts it well: 'Modern builders need a classification of architectural factors irrespective of time and


listed in the university catalogs for 1913–17, Bentley Historical Library (see n. 1).

83. Marie Frank, “Fiske Kimball and the Architecture Program at the University of Virginia,” ARRIS 18 (Oct. 2007).


85. See for example, the chapter "What is Architecture? The Poles of Modernism: Function and Form." Whether praising McKim, Mead and White's train stations or Sullivan's skyscrapers, Kimball argued that art maintained its "victory" over nature through abstract form. American Architecture (New York, 1928), 158–59, 182. David Brownlee has suggested that American supporters of the Beaux-Arts generally fell into two camps: those that championed its problem-solving methods and those attracted to the visual effect of its assembled forms. Kimball belongs with the latter. See Brownlee, Building The City Beautiful: The Benjamin Franklin Parkway and the Philadelphia Museum of Art (Philadelphia, 1989), 1–7. Brownlee also notes that Kimball's vocabulary owed a debt to Roger Fry, but Fry was himself familiar with Ross's work; see Frank, "Denman Ross" (see n. 13); and Stanckiewicz, "Form, Truth, and Emotion" (see n. 13).


87. John Carrère, City Improvement from the Artistic Standpoint (Hartford, Conn., 1908), 12. He used the Luxembourg Gardens as an example of beauty, understood as order, and expressed through the principles of harmony, balance, and rhythm. Carrère's copy of A Theory of Pure Design, given to him possibly by W. W. Bosworth, is now located in the Fine Arts Library of Bryn Mawr College.


89. Ibid., frontispiece. Magonigle also speaks about the beauty of line similarly to Ross and Dow (18) and mentions Ross specifically (31, 85).


91. Ibid.


93. Ibid. As noted earlier, De Garmo was one of the earliest promoters of the New Psychology in American pedagogy.

94. Thus, while Ross might define a line geometrically, the line could contain arbitrary curves, angles, or lengths. Likewise, Dow wrote that "the student must, however, be warned against mistaking a mere geometric combination for an aesthetic combination. There is no special virtue in a rectangular scheme or any other in itself; it is the treatment of it that makes it art or not art." Composition, 32 (see n. 21). Further, both Ross and Dow always linked geometry with representation and resisted the avant-garde abstract art of Europe.


97. Edward Forbes wrote: "Dr. Ross made friends with Hamblige and
worked with him and discussed these problems for several years. . . . [Ross] gradually worked away from Hambidge’s theories but developed a modified system of geometry. . . . It was much simpler than Hambidge’s scheme and in a general way laid down certain practical rules of procedure and organization of a picture.” Forbes to Theodore Sizer, 17 Apr. 1942, Sizer folder, HUA (see n. 39). In 1919, Hambidge received a Sachs Research Fellowship from Harvard, most likely with Ross’s backing. See also Forbes Files, HUAM (see n. 58); and Walter, “Jay Hambidge,” 94, 152, 160.


Bragdon was introduced to Ross’s work at the ALA convention in 1901 and sent Ross a copy of *Projective Ornament* (Rochester, 1915); Ross subsequently used plates from the book in his classes. Ross also wrote to thank Bragdon for sending him a copy of his book, adding, “I agree: that Design is founded in mathematics, particularly geometry. I agree also, that in Art we must proceed, not upon a basis of impressions but upon a basis of principles. The world order is much more important than the world aspect.” The last sentence is a paraphrase of Bragdon’s concluding paragraph in *Projective Ornament*. Ross to Bragdon, 20 Oct. 1915, Ross Papers (see n. 58).

99. Wittkower, “Changing Concept of Proportion,” 199–213 (see n. 45). Geometry’s benefit to both scholarship and practice had important repercussions for design in the twentieth century, as Alina Payne has argued in “Rudolph Wittkower and Architectural Principles in the Age of Modernism,” *JSASH* 53 (Sept. 1994), 322–42.


101. Hitchcock’s familiarity with Pure Design is addressed in Frank, “Hitchcock and Harvard: The Tradition of Formalist Aesthetics” (see n. 48).

**Figure Credits**

Figure 1, 3–6. Arthur Welsey Dow, *Composition* (Boston, 1899; 3rd ed., 1900): Fig. 1, p. 17; Fig. 3, p. 26; Fig. 4, p. 23; Fig. 5, p. 38; Fig. 6, p. 48.

Figure 2, 7, 8, 10, 11. Denman Waldo Ross, *A Theory of Pure Design: Harmony, Balance and Rhythm with Illustrations and Diagrams* (Boston, 1907): Fig. 2, fig. 232; Fig. 7, fig. 62; Fig. 8, fig. 203; Fig. 10, fig. 231; Fig. 11, fig. 35.

Figure 12. *School Arts Book* 4, no. 3 (Nov. 1904), 144–45.

Figures 9, 13–16. Denman Waldo Ross Papers, Harvard University Art Museums Archives: Fig. 9, box 21; Fig. 13, box 32; Fig. 14, box 27; Fig. 15, box 32; Fig. 16, box 34.

Figure 17. Harvard University Archives, HUC 8906.305.7 (IX)

Figure 18, 19. William Mowll and Charles Fabens Kelley, *A Text-book of Design* (Cambridge, Mass., 1912): Fig. 18, fig. 16; Fig. 19, fig. 84.