Woven Images:
From the Bauhaus Weaving Workshop to the Knoll Textile Division

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**Introduction**

In 1938 German émigré Hans Knoll set up Factory No. 1 in New York City, selling Scandinavian-inspired furniture to a small but growing crowd of American architects serving the new corporate American client. By chance, the small-scale furniture manufacturer met an ambitious young architect and the pair joined forces to expand into one of the most successful furniture, textiles, and interior design planning companies in American history, a company that achieved widespread success by midcentury. The architect’s name was Florence Schust, and she would eventually be recognized as one of the most influential figures in postwar American architecture and design. From 1946 to 1965, Florence directed all creative efforts at Knoll Associates, including a Planning Unit that designed interiors, and a Textile Division that served the Planning Unit by providing original materials for upholstery and drapery, and later offered cut yardage to the trade. Her Textile Division in New York operated like a mini-Bauhaus, with architects, weavers, and graphic designers all contributing towards the ultimate goal of producing eye-catching architectural materials for mass production. But unlike at the Bauhaus in the twenties and thirties, this midcentury workshop democratized the arts through the production of a single material. Rather than being considered, as it was historically, ‘women’s work,’ textile work occupied a highly visible position within Knoll Associates. Prominently featured within furniture exhibitions, architectural magazine advertisements, and high-profile corporate interior’s projects, textiles functioned on multiple levels as architectural material and graphic surface. At a time when the modernist aesthetic was considered to be radical in America—not yet classic or ubiquitous—Florence Knoll took all of her modernist architectural training and applied it to the design direction of her furniture, textiles, and planning company. Through a close reading of a key commissioned interiors project and primary materials from 1946-1965—when Florence Knoll was active creative director
and then president in 1955—my study re-frames textiles as critical, rather than ancillary, to the reception of modern architecture in postwar America.

Recently featured in an extensive exhibition at the Bard Graduate Center—“Knoll Textiles, 1945-2010”—commercially-produced textiles now rank as important artifacts of material culture, provoking American scholars across disciplines (architecture, design, material culture, women’s studies, et al.) to study textiles from multiple perspectives. While art historians have long studied tapestries and ancient wall hangings as markers of culture and societal change (Semper and Reigl, among others), textiles designed for mass-production exist in a complicated position between art, commodity and non-art, leaving the historic record of modern and contemporary textiles as a relatively new terrain to explore. Exhibitions like “Knoll Textiles, 1945-2010” fill in much-needed factual accounts of textile manufacturing in the United States, along with bringing to the fore important creative talents like textile designer, Eszter Harastzy, whose work for Knoll Textiles often gets sidelined by more famous Knoll architect/designers like Eero Saarinen, Marcel Breuer and Mies van der Rohe. Bobby Tigerman’s “The Heart and Soul of the Company: The Knoll Planning Unit, 1944-65,” a revision of her 2005 thesis, “I Am Not a Decorator: Florence Knoll, the Planning Unit, and the Making of the Modern Office,” represents one of the most theoretically engaged accounts of Florence Knoll’s contribution to the company thus far, although her foray into the intricacies of the Textile Division is minimal. Tigerman argues that the successful postwar launch of the company was in large part due to Florence Knoll’s architectural training and her ability to humanize modernism into a look that her American architectural clients desired. Focusing on the Knoll Planning Unit, the interior design service division within the company, Tigerman brings to light several important aspects of Florence Knoll’s contribution to the company, particularly her ability to translate the modernist idea of the ‘total work of art’ into a style suitable for the corporate American interior, a new terrain for architects. Her claim is significant because it challenges the hierarchy of architecture over interior elements like furniture and fabrics, and opens up the
architectural discourse to include figures not typically associated with the development of postwar American architecture. My study builds on Tigerman’s. My focus, however, is on the Textile Division at Knoll rather than the Knoll Planning Unit Division, in part to investigate the specific impact of textiles within the architectural community at midcentury, and to link up the Bauhaus Weaving Workshop in Germany to the Knoll Textile Division in the United States more concretely, an important pre-history that contextualizes the impact of European modern weaving within the greater project of American modernism. Other studies of Knoll include Phillip Hofstra’s “Florence Knoll, Design and the American Office Workplace”—an analysis of Knoll’s role in the professionalization of the interior designer—and “Ideas as Interiors: Interior Design in the United States 1930—1965” by Lucinda Havenhand, a collection of case studies meant to bring interior design into the discourse of modern art and architecture in America. Also of note, Knoll au Louvre: Catalog of the Exhibition Held at Pavillon De Marsan, Musée Des Arts Décortifs, Knoll Design and The Bauhaus: A Japanese Perspective and a Profile of Hans and Florence Schust Knoll—each contribute important factual accounts to Knoll’s historic record.

One of the unstudied aspects of Knoll textiles is the unusual treatment of textiles within advertisement campaigns. While Tigerman includes ads as part of her primary evidence to argue for the success of the ‘Knoll Look,’ she examines the Knoll Planning Unit ads rather than the textile ads to show how the “fusion of architectural space and its contents” performed a contemporary Gesamtkunstwerk within physical space. However, a closer look at the textile ads reveals another level of modernist principles at play. Rather than show Knoll textiles in situ, installed as a transparent drapery against a curtain wall or upholstered on a Saarinen chair, the textiles often act as non-objects, contributing towards a painterly composition of line, form, and color that perform no function other than aesthetic. I argue that the unconventional representation of textiles within ads—through the abstraction of scale and use, along with the juxtaposition of disparate elements alongside textiles—contributed to the public’s perception of Knoll as leader of modern design more
than the traditional layouts of furniture and textiles which generated desire for the products on a subconscious level. A recent dissertation by T’ai Lin Smith, “Weaving Work at the Bauhaus: The Gender and Engendering of a Medium, 1919-1937,” discusses the intricate relationship between photography and textiles at the Bauhaus, describing how Bauhaus weaver, Otti Berger, challenged the hegemony of vision over touch through theoretical writings supplanted by photographs of textiles. Smith introduces the idea that it was through the experimental representation of textiles—photographic close-up shots of fibers woven together to abstract scale and use—that helped weaving to gain recognition as an artistic medium of both a visual and a tactile nature, one on par with architecture, painting and sculpture. While Smith’s goal differs from mine—she argues for the medium specificity of weaving—her discussion of representation sets up an important historic precedent for the complex nature of photographing textiles, especially in the midst of a modernist discourse dominated by optical perception. Florence Knoll’s textile advertisements show an acute awareness of textiles’ strengths and weaknesses as a tactile art, theoretically and formally. By focusing our lens on the multiple functions of textiles within the company—from architectural material to graphic surface, we see how Knoll’s success as a leader of American modernism was much more complex than previously understood. This reexamination has three goals: the first is to reject the hierarchical position of architecture over textiles in favor of a more holistic understanding of the period in which Florence Knoll was actively promoting modern architecture through the decorative arts of furniture and textiles, while the second is to draw a continuum between the work of European textile designers at the Bauhaus in the 1920s and 1930s—designers like Anni Albers, Gunta Stolzl and Otti Berger—to the work of weavers and textile designers within Knoll’s Textile Division from the late 1940s to the early 1960s, showing how early weaving experiments in Germany influenced the next generation of weavers and textile designers in America. Finally, I will discuss how textiles were instrumental in the construction of the ‘Knoll Look’—a phrase coined by the media as Knoll gradually came to dominate the corporate interiors
market and become ubiquitous with the modern corporate interior. I argue that the multiple functions of textiles contributed towards Knoll’s dominance within the field, demonstrating Florence Knoll’s ability to generate desire for a commodity (textiles) previously undervalued by architects.

**Social, Biographical and Historic background**

Florence Knoll came to design by way of architecture. She held a professional architecture degree from ITT, studying under Mies van der Rohe there and then apprenticing for Walter Gropius and Marcel Breuer before working at Harrison & Abramovitz in New York City, an architectural firm focusing on large-scale corporate projects such as Rockefeller Center and the United Nations Building. She held close family ties to the Saarinen family, first developing a friendship with them during her school days at the Kingswood girls’ school (1932-34) where the bright, young student came into contact with Eileel Saarinen, president of the newly-formed Cranbrook Academy of Art in Michigan, his wife, Loja, director of Cranbrook’s Weaving Department, and their son, Eero. As an orphan, Florence boarded at Kingswood and then at Cranbrook, eventually spending holidays, vacations, and trips back to Finland with the Saarinen family where the architect and the textile designer had emigrated from. Knoll recalled later that at Cranbrook, "everybody was interested in everything, from weaving, pottery, architecture and city planning to furniture." The integrated design philosophy of her academic mentors there, at ITT, the Columbia School of Architecture and the Architectural Association in London, where she also took architectural courses, came through prominently in her future work at Knoll Associates, but unfortunately at Harrison & Abramovitz she recalled that "being a woman, I was given interiors..." later stateing that "...everything I did was based on my architectural training." Despite her strong background in architecture and her close relationship with prominent architects in America and Europe, Knoll was still pegged as a female
designer, given the ‘women’s work’ of architecture—interior decorating. In 1943 she met Hans at her office, when the furniture maker paid a sales call to Harrison & Abramovitz. Hans was an ambitious German émigré, the son of Walter C. Knoll, a manufacturer of Mies van der Rohe’s furniture pieces in Stuttgart before World War II. The charismatic salesman founded the Hans G. Knoll Furniture Company in 1938 in New York City, joining forces with Florence soon after meeting her and asking her to consult on several of his interior design projects. Florence joined the company in 1943, forming the Knoll Planning Unit within Hans’ company to address the much-needed gap between furniture design and modern architecture. In 1983—the year she received the Rhode Island School of Design’s Athena Award for creativity and excellence in design and art—she said that “it was an exciting time, but it was mostly hard work. We had to battle the prejudice against contemporary design.” Knoll is viewed as a pioneer of American modern design, credited alongside Herman Miller (manufacturer of the now-ubiquitous Ray and Charles Eames’s molded plywood chair and George Nelson’s much-copied platform bench) as creating the market—the products and the desire—for contemporary interiors.

The leap from architect charged with interior design within a large corporate firm to creative director of a small-scale furniture company might seem strange for a woman who always described herself as an architect, but considering the dearth of architectural heroines up to 1943, the opportunity of creative leadership just outside the profession was apparently more appealing than the creative limits of the glass-ceiling within. As architectural historian Gwendolyn Wright points out in the exhibition catalog of curator Susanna Torre’s Women in American Architecture: A Historic and Contemporary Perspective, the roles of women in architecture up to the 1970s included “exceptional women,” “adjunct,” “anonymous designer,” and “woman outside.” Torre notes that some of the exceptional women in America formed creative partnerships with their husbands. Well-known couples such as Ray and Charles Eames and Denise Scott Brown and Robert Venturi as well as lesser-known husband and wife teams like Noemi and Antonin Raymond make up the short list
of married architecture/design couples, while Charlotte Perriand and Le Corbusier, and Lilly Reich and Mies van der Rohe represent two prewar, professional/personal collaborations.  

Julia Morgan is considered one of the earliest American pioneers of the profession, graduating from the École des Beaux-Arts in 1902 and starting her own practice in San Francisco in 1904, while Marion Mahoney Griffin was the first woman to receive a professional license in the US. Griffin worked for Frank Lloyd Wright at the turn of the century and was described retrospectively as "the most talented member of Frank Lloyd Wright’s staff." Catherine Bauer—wife of architect William Wurster—Elizabeth Coit, and Natalie de Blois, of Skidmore, Owings, and Merrill, round out the small number of practicing women architects in the thirties and forties, but as scholar Judith Paine notes of women in corporate firms, few became partner and even fewer reached associate status. Reflecting back on the period, Mary Otis Stevens notes that women architects' work in the 1940s and 1950s in the corporate field was considered imitative if it was recognized as all, “reflective of [women's] minority status.” In contrast, the business partnership of Florence and Hans Knoll appears to be equal if not matriarchal in terms of artistic output. As Tigerman notes, each brought specific talents to the company—Hans was entrepreneurial, while Florence was the creative force, concentrating on all design aspects of the company from its public image to the furniture, textiles, and interiors.

**Textiles as Architectural Material**

In 1946, Florence and Hans married and changed the name of the company to Knoll Associates, Inc. By this time, “[they] were well on their way to creating their own market, one for which no vocabulary of furnishings existed: the new architecture.” The production of textiles in-house became a vital component to the company as the Knoll Planning Unit received its earliest architectural interior commissions. As the Planning Unit brochure stated:
Since its inception the Knoll organization has endeavored to design and produce furnishings and interiors appropriate to contemporary architecture and suited to the changing needs of modern living...[growing] out of a demand by private and architect-clients to provide interiors in which the concept embodied in the Knoll line of furniture and fabrics is carried to its logical conclusion: fusion of architectural space and its contents.\textsuperscript{25}

In the beginning, it was just Florence and Hans running the show, and she did not produce her own textiles; instead she outsourced the upholstery and drapery for Knoll’s one-off furniture pieces. Knoll had to search within men’s apparel fabrics to find the appropriate material to upholster their custom-designed furniture, as there was no go-to source for the small community of corporate clients who wanted modern furniture and fittings for their office interiors. Developing their own line of upholstery and drapery fabrics became a priority for the company, and it was only a year later that Knoll opened a showroom on East 65th Street in New York to sell the first collection of Knoll Textiles.\textsuperscript{26} From her network of colleagues and friends, Knoll hired the most talented weavers and designers she could find to design the first collection, including the Finnish weaver, Marianne Strengell (Loja Saarinen’s right-hand woman and director of the Cranbrook Academy Weaving Dept. from 1937-1961), and half a dozen others, eventually hiring an entire team of textile designers to design both hand-woven textiles and textiles meant for machine loom production. According to Knoll, only “brocade and chintz with cabbage roses” were commercially available—a far cry from the bold, bright textural weaves that Knoll came to be known for.\textsuperscript{27}

Eventually one-off fabrics for individual commissions become standards within the line, allowing the Textile Division to grow alongside the furniture division. One such example is Transportation Cloth, designed by Hungarian-born Eszter Haraszty in 1950 (see fig. 1). Originally designed for use within the General Motors Technical Center (GMTC), a significant project for the Knoll Planning Unit that received widespread media coverage in architectural and popular magazines, the all-rayon upholstery fabric was “the first industrial fabric, the first one that stood all
the tests,” according to Harastzy.28 Included in both the Good Design exhibition in 1951 and Textiles USA in 1956 at the Museum of Modern Art, the plain weave was recognized for its attractiveness, durability, and quality, representing one of the “new textiles intended to be simultaneously beautiful, functional, and economical.”29 Designed for machine loom production, the weave is both innovative and simplistic in that it incorporates one of the first semi-synthetic fibers—rayon was first introduced in the US in 1910 as an alternative to silk and was one of the strongest fibers at the time—into a plain yet rhythmic two-color weave. Covering upholstered furniture within the GMTC ‘research campus’ described by President Eisenhower as “a new adventure for frontiersmen” at the dedication of the American company’s grand opening, Transportation Cloth symbolically represented the strength, speed, and styling of industry that President Eisenhower, and the nation, believed in.30

Figure 1. Eszter Haratzy. Transportation Cloth. 1950.

The architect of the GMTC was Eero Saarinen, Florence’s de facto brother and a major contributor to Knoll’s furniture line— his sculptural, fully upholstered Womb Chair (1948) was included in many of the Planning Unit’s projects. Designed to house 5,000 scientists, engineers, designers, technicians, and other GM personnel who worked on everything from pure science to styling and process development for the automotive giant, Saarinen’s complex was described by Life magazine
as the Versailles of Industry, a collection of modern monumental forms upon the American midwestern landscape (see fig. 2). Architectural historian, Alice T. Friedman, notes that it was the “extraordinary interior spaces of the GMTC that made Saarinen's project truly distinctive,” with luxurious, yet contemporary material, (like Transportation Cloth) generating a feeling of opulence and technological prowess for the client (see figs. 3 & 4).
Figure 3. Built-in upholstered sofa and upholstered side chairs in the office of GM Vice President, Harley Earl. 1956.

Figure 4. Note the floor-to-ceiling transparent drapery and additional upholstered sofa and chairs.
For Haraszty, the GMTC project was an opportunity to experiment with new textures and materials. Curator Earl Martin notes that within her portfolio, she pinned *Transportation Cloth* samples with the warps running horizontally, an unusual practice in that warp fibers run lengthwise off the loom and patterns typically a weft-driven, if not weft-facing design. In traditional tapestry making, the weft completely covers the warp, woven tightly across and between the supporting fibers (warp) to generate a pictorial pattern. While not the first to expose the warp, Haraszty, by shifting the orientation of viewing, highlights how she considered the structural element of the fabric a vital part of the artistic expression.

Exposing the structure of a fabric was a concept gleaned almost directly from the Bauhaus. Several German émigrés from the Bauhaus Weaving Workshop came to the United States after the Bauhaus closed in 1933. As Anni Albers, a prolific artist who would eventually become one of the most famous and influential weavers in the US and a contributing weaver for Knoll in the late 1950s, notes in her 1965 *Introduction to On Weaving*, it was at the Bauhaus that the approach to textile design shifted from decorative to structural: while Jugendstil textile designers in Germany and those at the Wiener Werkstatte in Vienna were still heavily influenced by William Morris’s nineteenth-century concern for artistic decorative design, drawing up designs on paper before using the loom, it was Bauhaus weavers who experimented at the loom directly to develop new patterns based on structure rather than figural or naturalistic patterns. Albers was a student of Swiss weaver, Gunta Stolzl, the only female Bauhaus master who also later contributed her designs to Knoll. As Stolzl states in 1931:

> Woven fabrics in a room are equally important in the larger entity of architecture as the color of the walls, the furniture and household equipment. They have to serve their “purposes,” have to be integrated, and have to fulfill with ultimate precision the
requirements we place on color, material, and texture. The possibilities are unlimited.

Understanding of and feeling for the artistic problems of architecture will show us the right way.36

At the Bauhaus, the Weaving Workshop operated as one of the craft workshops alongside others like carpentry, wall painting, metal, pottery, and bookbinding, and held fast to the Bauhaus manifesto that “the ultimate goal of all visual arts is the complete building.”37 Founder Walter Gropius believed that craftsmen and artists should work in cooperation, rather than in isolation from each other, and that every eligible candidate, regardless of sex or age, was considered for acceptance into the school. This egalitarian attitude was quickly amended to exclude women from almost all of the workshops, developing a Women’s Department instead that became the Weaving Department in 1920, the designated “woman’s field of work” where female students, regardless of former training or interest, were either directed to or joined later because of hostile attitudes elsewhere (painting, for example).38 A form master taught theory to the students, while a workshop master taught the technical skills of the craft. In the Weaving Department, Johannes Itten first taught the form courses to the weavers, followed by George Muche, Josef Albers, and Paul Klee.39 Technical masters included Helene Borner, Gunta Stolzl, and Lilly Reich who was appointed by Mies van der Rohe during the penultimate year at Dessau, in 1932.

Harastzy’s textiles were formally and theoretically in dialogue with her predecessors’ work at the Bauhaus.40 When she came to the United States in 1947, Haraszty’s first lived with Hungarian émigré Marcel Breuer and his wife, Constance, absorbing ideas from Breuer, the Bauhaus master who had fled Nazi Germany and taught at Harvard alongside his former Bauhaus colleague, Walter Gropius. As noted earlier, Florence Knoll apprenticed for Breuer and Gropius in the early 1940s, and according to Haraszty, it was Breuer’s idea to contact Knoll about a job after he had used one of her printed stripes for drapery within his “House at the Museum Garden” at MoMA in 1949.41
Transportation Cloth came out of the context of the Bauhaus influence on structure as design over applied decoration of warp/weft construction, and within the interiors of the General Motors Technical Center and beyond, the textile functioned as an architectural material rather than a decorative element, suiting the ‘new architecture’ that Knoll and her husband were helping to bring about in America. As Penny Sparke notes in Designing the Modern Interior, by the 1950s and the 1960s the “Florence Knoll-style interior setting” had become a ubiquitous style for the corporate American interior, facilitated not only through the translation of modern architectural principles into interior space planning and furniture, but also through her Bauhausian approach to textile production.42

Textile as Graphic Communication Aid

Knoll’s innovation in promoting modern textiles did not stop at production. Textiles within Knoll Associates not only functioned at the level of architectural material, they also functioned as graphic surfaces within advertising campaigns—surfaces that the sophisticated client could appreciate on an aesthetic, rather than conventional level. Instead of representing the goods in situ, as Knoll furniture ads before Florence’s involvement shows, the fabrics under her direction became two-dimensional elements within formal compositions of line, form, and color. In short, Florence Knoll’s photographed textiles act as components of modern art, removed from their traditional role as window coverings or seat cushions and represented as flat—yet highly textural—graphic elements.

For example, an advertisement designed by Herbert Matter in 1952 features Eszter Haraszty’s Transportation Cloth as floating lengths of cloths photo-montaged on top of a technical drawing of a railroad handcar (see fig. 5). Each of the three elements on the page is of almost equal width and height, justified center in a vertical row of three. The rational arrangement of parts on a
white background evokes the endless Cartesian space of the modernist grid, while the ground plane—the railroad tracts cut short to mimic the moving parts of the handcar—becomes part of the vehicle through a shared tint of blue. There is no visceral connection between *Transportation Cloth* and the pump trolley beyond the juxtaposition of a mode of transportation—albeit an outdated, human-powered one—with textural fields of color; however, the eye-catching montage of machine with photographs of cloths in motion directly appealed to Knoll’s target audience—the contemporary American architect inspired by European modernism.

*Figure 5. Herbert Matter. *Transportation Cloth* advertisement. 1952.*
Embedding *Transportation Cloth*, one of Knoll’s high-traffic upholstery fabrics designed for Saarinen’s GMTC, into a powerful image of dynamicism, speed, and technology demonstrates Knoll’s sophisticated promotional technique—one in line with prewar European practices—like the propaganda art of the Russian Constructivists or the “readymade” compositions Le Corbusier created in the pages of his magazine, *l’Esprit nouveau*. In addition, the strategy of obscuring the use value of the object for sale in favor of cultivating an appealing visual composition speaks to the complexity of Knoll’s selling practices in attracting the desired modern American client. As material culture scholar, Cecile Whiting, notes in *A Taste for Pop*, American luxury stores began to use the fine arts as model for display as early as the 1920s (as examples, she cites Manhattan department stores Saks, Bergdorf Goodman, and Bonwit Teller). Whiting quotes Walter Hoving of Bonwit Teller, who instructed his designer, Gene Moore, “to do two things: Make [the window displays] beautiful according to your own view and don’t try and sell anything.” According to Whiting, the window display became modern art—attracting the cultured shopper who appreciated the references to the avant-garde, in part because her recognition of ‘high art’ principles—of line, form, and color—identified the shopper (to herself and to others) as one of the socially elite. Similarly, Florence Knoll’s textile ads convey the feeling of the avant-garde through the abstraction of the objects for sale, and like the Fifth Avenue luxury stores’ designers, Knoll’s graphic designer “subsume[s] the objects for sale to the higher principles of the fine arts to produce a form of modern art...,” a strategy that not only created striking compositions, but successfully conflated textiles with modern art.

To create the advertisements, Knoll worked closely with her graphic designer, Herbert Matter, a Swiss émigré who studied under the highly influential Parisian artists, Fernand Leger and Amédée Ozenfant, before working as a designer and photographer for the legendary French type foundary, Deberny & Peignot, in 1929. His position there brought him into contact with significant clients, including Le Corbusier, whom Matter assisted only a few short years after *l’Esprit nouveau*
(1920-1925) and Vers une architecture (1923) circulated throughout Europe, promoting the power of architecture to transform society. L’Esprit nouveau was filled with the creative use of images taken directly from industrial product brochures and catalogs, and according to architectural theorist, Beatriz Colomina, the presence of these “readymade” photographs in Le Corbusier’s journal—from automobiles, airplanes, and industrial equipment to office furniture and consumer goods like suitcases and watches—were not only “an internal exchange among avant-garde movements...” but in fact, “a dialogue with an emerging new reality, namely the culture of advertising and mass media.”

Formally, the influence of Le Corbusier’s “readymades” cannot be denied within Knoll’s Transportation Cloth advertisement and others like it, which could easily be attributed to Matter’s earlier involvement with the Swiss architect. But if one looks back to the Bauhaus and considers the activities of the Bauhaus weavers in response to new forms of advertising and mass media, a case can be made that the birth of modern textiles (narrowly defined through the lens of European modernism) coincided with the birth of modern representation—namely photography. In "Weaving Work at the Bauhaus: The Gender and Engendering of a Medium, 1919–1937," T’ai Lin Smith points out that Bauhaus textiles became known through the camera lens, entering the public domain through advertisements in magazines and brochures rather than only at industry trade shows, problematizing the deep-seated belief that textiles were inherently not a visual art. Considered as a craft inferior to architecture, painting, and sculpture at the Bauhaus, textiles faced considerable marginalization as a tactile art in the context of debates on the centrality of optical—rather than tactile—perception as a sign of cultural progression. Smith shows how Bauhaus weaver, Otti Berger, sought to elevate weaving’s status to the higher arts (of architecture, painting, and sculpture) through extensive writings on the interdependence of tactility and vision, directly responding and reacting to theories set out by Reigl in his Late-Roman Art Industry in which the “optical” was hierarchically situated above the “tactile” in the visual arts. But interestingly enough,
Smith argues that textiles came to “depend on the photographic medium to give it status and definition in the world,” meaning that the representation of modern textiles—in Bauhaus ads and brochures—often adjudicated the physical tactile characteristics of the medium in favor of the perceived (optical) translation of texture, structure, and form into 2-D.\textsuperscript{52}

At the Bauhaus, photography was used as an experimental tool and as an image-recording device, producing both standard product photographs for pro-industry magazines like the Deutsche Werkbund’s, \textit{Die Form}, and artistic compositions meant for unmitigated exploration of the new medium.\textsuperscript{53} Photographic close-ups of textile samples within the \textit{bauhaus} magazine were the most striking examples of experimental photography and non-representational images, promoted by Bauhaus form master, Laszlo Moholy-Nagy, whose investigations of the limits of the medium attracted him to materials—like woven structures—that would best reveal the “light-dark” properties of photography.\textsuperscript{54} On the back cover advertisement of the 1931 \textit{bauhaus} special issue on the weaving workshop is an extreme close-up of a woven curtain fabric, translated as a grid of undulating lines, crisscrossing the page horizontally and vertically with no end points or start points (see fig. 6). A sense of infinite—yet tension-filled—texture appears as the twisted yarns stretch across the page in a series of irregular light and dark squares.

\textbf{Figure 6.} Ilse Voigt. \textit{durchsichtiger Vorhangstoff}. 1930. Photograph by Walter Peterhans.
The size of the individual fibers is larger than the size of the accompanying descriptive text below by three-fold, producing a play of light upon the surface rather than informing the reader of the fabric's use. Paradoxically, Isle Voigt's durchsichtiger Vorhangstoff fabric (transparent curtain fabric), is photographed to eliminate a functional reading of the textile—showing how it might disappear against a curtain wall within an architectural interior—by privileging a more dramatic, high-contrast image that performs the opposite of transparency. The fabric's ability to represent structure, light, and form is what the viewer sees, substantiating Otti Berger's insistence that tactility and vision were interdependent, while suggesting that modern weavers at the Bauhaus were well aware of the product they were selling—not the textiles themselves, but the images of textiles.

Conceptualizing textiles as products of visual currency rather than only as material expression gives much more intellectual weight to the textile designers at the Bauhaus, and in turn, the textiles designers influenced by them within the Knoll Textile Division. Untying modern textiles exclusively from the history of craft production—a realm denied an internalized process resulting in external expression—and connecting them with the history of modern representation, photography, allows one to make that case that textile designers designed for representation along with use. Counteracting the notion that modern textile designers only mimicked architecture in structure and form, one can argue that modern textile designers were influenced by the representation of textiles themselves, gleaning ideas from the flat yet super structural images produced through formal investigations of cloth and light. Haraszty's Transportation Cloth is image-ready, performing for the camera as only a pliable yet structurally-driven design can be. The high performance of Knoll's textiles thus behaves on two levels; one at the basic, durable level (a critical factor nonetheless), and the other on the conceptual level, as a performance in the total visual campaign reaching the consumer at a level beyond sleek furniture and fabrics. Textiles contributed towards the subconscious desire to be modern in America, and through the
collaborative efforts of Knoll’s weavers and artists, Knoll established her company as the driving force of modern design in America at midcentury.

To conclude, the historic, social, and formal analysis of textiles in postwar America serves a much greater purpose than a mere appreciation of an often-overlooked object of material culture. As is clear from the case of Knoll, textiles were a necessary component in the multilayered campaign to promote modern furniture and interiors in the postwar American architectural community, not only in the traditional sense as mass-produced material for architecture, but as a visually-appealing element in the advertising campaign to promote the decorative arts as modern art. As I’ve argued, selling a new commodity through the exchange of images occurred earlier through the efforts of the Bauhaus Weaving Workshop’s designers. Within Knoll’s Textile Division, weavers and textile designers received widespread recognition for their designs—celebrated as creative producers rather than nameless workers—and were highly visible actors in the collaborative effort to promote Knoll as a modern design company. For architecture and for women’s history, bringing historic instances such as these into modernist studies can only be positive, allowing more compelling and complex histories to be woven into the discourse.
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**Notes**

1 Florence and Hans married in 1946 and she changed her name to Florence Knoll. After Hans died in a car accident in 1955, the widowed Knoll met Harry Hood Basset and married the successful Miami banker in 1958, becoming Florence Knoll Bassett.

2 This connection has been made apparent by Knoll with exhibitions in Japan, and articles such as Satomi Mizuno, "Knollexiles, Marianne Strengell, Anni Albers, Angelo Testa," in *Bauhaus and Knoll Textiles* (Tokyo: Knoll International Japan, 1989), but few in-depth studies have ensued.

3 Bobbye Tigerman, "The Heart and Soul of the Company: The Knoll Planning Unit, 1944-65," in *Knoll Textiles*, ed. Earl Martin (New Haven [Conn.]: Published for Bard Graduate Center by Yale University Press, 2011); Bobbye Tigerman, ""I Am Not a Decorator": Florence Knoll, the Knoll Planning Unit, and the Making of the Modern Office" (M.a., University of Delaware (Winterthur Program), 2005).

4 P. Hofstra, "Florence Knoll, Design and the Modern American Office Workplace" (Ph.D., University of Kansas, 2008); Lucinda Havenhand, "Ideas as Interiors: Interior Design in the United States 1930--1965" (Ph.D., Virginia Commonwealth University, 2007).


6 Tigerman, ""I Am Not a Decorator": Florence Knoll, the Knoll Planning Unit, and the Making of the Modern Office". 7.


8 Tigerman, 34.

9 Ibid, 22.

10 Ibid.


12 Ibid.

13 Knoll International and décoratifs Musée des arts, 8.

14 Tigerman, 35.

15 Giovanni, "Florence Knoll: Form, Not Fashion."

16 Ibid.

17 Tigerman, 17.


19 Noemi Raymond designed textiles for Knoll as well. Ibid.
21 Torre, 115.
22 Ibid.100.
23 Tigerman, 35.
24 Knoll International and decoratifs Musee des arts, 8.
25 Tigerman, 6-7.
26 Ibid. 55.
28 Earl Martin and Design History Material Culture Bard Graduate Center: Decorative Arts, Knoll Textiles (New Haven [Conn.]: Published for Bard Graduate Center by Yale University Press, 2011).
33 Martin and Bard Graduate Center: Decorative Arts, Knoll Textiles., 145.
34 While Haraszty designed fabrics for commercial use, the practice of exposing weft became a way for fiber artists in the late 1960s and 1970s to react to and reject the hegemony of tapestry over other forms of textile art. For example, in 1985 Michael Thomas notes in Textile Art that textile artists abandoned the technique of loom weaving altogether in favor of 'off the loom' work, a radical response meant to question the definition of tapestry rather than adhere to its values, many of which had been established in the Renaissance and held through till the middle of the twentieth century. In practice, woven loom textiles are simply two threads crossed at right angles, but in theory, Western textiles had long been central to heated debates on ornament, style, and the effects of industrialization on artistic practices. Art historians like Gottfried Semper (1803-1879) and Alois Reigl (1858-1905) both introduced seminal methodologies of architectural and cultural analysis based on their investigation of textiles. Semper theorized upon the origins of architecture via weaving whereas Riegl reacted to Semper's notion of materialism in order to develop his own theory of "artistic will" read through the surface ornamentation of art objects he came in contact with at the Austrian Museum of Art and Industry, where he was curator of textiles from 1887-97.
39 Ibid. 41.
40 As the daughter of an upper middle-class family in Hungary, she had studied painting, color theory, and art history at the Royal Academy of Fine Arts in Budapest before WWII, landing in New York City in 1947 after political upheaval at home prevented her from returning to an unstable, Communist-led country. Martin and Bard Graduate Center: Decorative Arts, Knoll Textiles., 335.
41 Ibid.
43 *Life* magazine and *Architectural Forum* both ran spreads on the project. Friedman, "Modern Architecture for the "American Century"; Eero Saarinen and the Art of Corporate Image-Making.", 126.


45 Ibid. 15.

46 Ibid. 16.

47 Whiting brings up Austrian-American designer, Frederick Kiesler, who wrote *Contemporary Art Applied to the Store and its Display* in 1930, and describes how he instructed designers to adopt the principles of modern art for the shop window. Ibid. 17.


49 Smith, "Weaving Work at the Bauhaus: The Gender and Engendering of a Medium, 1919--1937.", 183.

50 Ibid.

51 Ibid.

52 Ibid.

53 Ibid.

54 Ibid.