

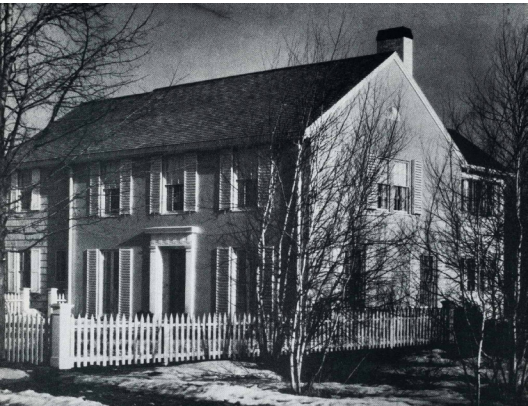
## Innovative Women in Architecture & Sustainability: Eleanor Raymond, 1887-1989

by Gail M. Cavanagh

During the early years of women's participation in the architectural profession, women made very few significant or major contributions because the prevailing culture of the era held rigid views about a woman's role. Up until 1958, there were only 320 registered women architects in the United States representing 1% of total registered architects.<sup>1</sup> One early practitioner, Eleanor Raymond, wouldn't allow her dreams to be limited by the expectations of others. Not only did she smash through strict conventions to pursue her architectural interests; she is also credited with numerous forward-thinking innovations.

Raymond attended Wellesley College, receiving a Bachelor of Arts in 1909. After a year of travel in Europe, Raymond enrolled in the newly founded Cambridge School for Architecture and Landscape Architecture in 1917. Until the Cambridge School was founded 1916, it was impossible for a woman to receive a degree in architecture from the universities that offered such a program. Most women who were able to become involved in architecture during this time period received engineering or Bachelor of Science degrees in related fields.<sup>2</sup>

Henry Atherton Frost was a co-founder of The Cambridge School. During the time of Raymond's attendance, the school's curriculum emphasized that women would only be taught domestic architecture. It was considered unseemly and highly unlikely that a woman would work in the male dominated environments that were architectural practices. This was the first of the societal norms of this era that Raymond chose to ignore. In 1919, Raymond partnered with Frost at his Boston firm, shouldering past the first articulated objection to women in practice. They designed the Cleaves House together in 1919.<sup>4</sup>



Cleaves House, designed by Frost and Raymond, 1919

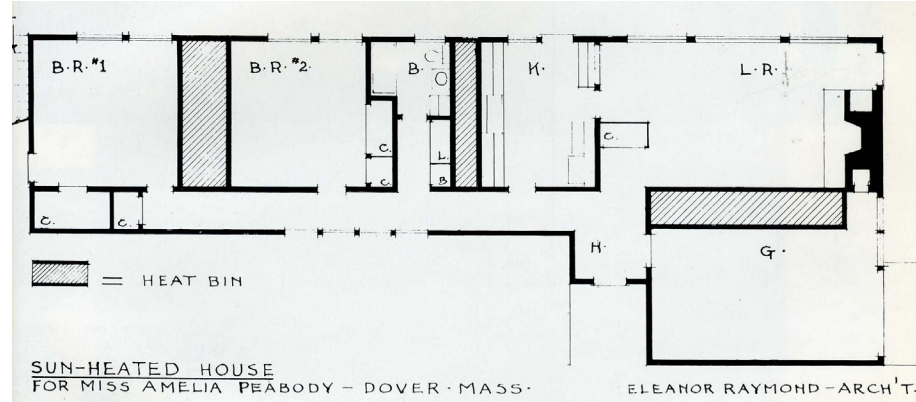
Students of architecture received classical training during this period, heavily influenced by the Beaux Arts. Even though Raymond concentrated her studies in the classics, her personal technique quickly evolved. Exhibiting early signs of becoming an independent thought-leader in architecture, her work began to develop into an elegant and uncomplicated approach to design. As early as 1931, the Rachel Raymond House in Belmont, MA illustrated a resolute departure from the traditional style currently in vogue for residences. Raymond was able to reinterpret the International style she observed in earlier travels to Germany and returned to adapt the unaccustomed modern forms into the traditional New England landscape. This home was demolished in 2006.

In 1935, Raymond opened her own practice. Such nomenclature as "adaptive reuse" and "sustainable design" had yet to seep into the architectural vocabulary, but she was in the forefront of applying these concepts in her work. She experimented with adaptive reuse when she bought property in Boston and gutted an existing structure to be redesigned into her home and office. The city street was to be widened so ten feet was sheared off the front of the brick structure. Raymond added onto the back of the building, replacing lost space, and opened the addition to fenced in gardens.



Rachael Raymond Home, designed by Eleanor Raymond, 1931. In the AIA's 2009 COD Ideas Competition, the call for entries asked for the home to be redesigned. Entries were to remain true to the modernist ideas that were important to Raymond and include today's sustainable strategies. See <http://www.aia.org/practicing/groups/kc/AIAS075321>.

The Great Depression was her chance for further study of vernacular architecture in other parts of the United States. Because her office did not have work, she decided to drive around the countryside of Pennsylvania compiling a photographic journal of residential structures and outbuildings. "Early Domestic Architecture in Pennsylvania" was



Sun House Plan, drawn by Eleanor Raymond, 1948. Note bins for heat storage.

published in 1931 and the book was considered a groundbreaking work in architectural documentation.

Her willingness to be influenced by new ideas in technology, materials and design philosophy set the stage for lifelong experimentation. A solar water heater was first patented in the US in 1891 and by 1909, William J. Bailey had elaborated on the original invention and patented a solar heater that had the capacity to store the sun's energy.<sup>5</sup> With the advent of this invention, experiments in heating a structure were undertaken by universities such as M.I.T., which had built its first solar test lab in 1936.<sup>6</sup> This new technology was the catalyst to the design of the Sun House completed in 1948.<sup>7</sup> The Sun House is especially significant to the list of her experiments because it was the first structure built by a woman architect to integrate an active solar heating system into an occupied residence.<sup>8</sup>

Ms. Amelia Peabody was the client for the Solar House providing the site and the funding. Dr. Marie Telkes, an assistant in the M.I.T. department of metallurgy, was the designer of the heating system and Raymond was the architect.<sup>9</sup> Dr. Telkes' experiment in solar heating was different from the solar lab/home built by MIT. MIT used water as the storage device but Dr. Telkes used sodium sulfate decahydrate.<sup>10</sup> Four lineal feet of collecting glass could gather and store only enough heat for a room four feet wide by seventeen feet deep. Therefore, the floor plan could only be one room deep. The solar collection panels needed to be very large in order to capture enough radiant energy to be stored to service the building in the New England climate. Also, the storage system, consisting of large metal drums, took up an enormous amount of space. Consequently, the entire second level, consisting of glass collector panels could not be used as livable space.

The solar collectors were two-ply glass sheets painted black with an air space behind. Duct fans circulated the air to heat bins on the first floor and excess heat could be stored up to eight days in the sodium compound, which melted as it collected heat. The heat was distributed to the rooms from the drums as the salt recrystallized and released the absorbed heat. Raymond's task, to make a livable, attractive home while integrating this new technology, became a highly significant step in the ongoing development of more advanced and efficient solar heated homes that are becoming more important now and will become more critical in the future.



Sun House, South Elevation, Raymond, 1948

The solar experiment worked well for four years, keeping the occupants, a cousin of Dr. Telkes' and his family, warm through the winters. After that time, a problem developed with the drums storing the sodium compound. As they began to leak, the experiment was terminated but the house continued to be occupied for some time using a conventional furnace system which Raymond had the foresight to plan into her design.

As her clientele expanded, her opportunities for experimentation only increased. One of her clients was the owner of a company that manufactured plywood panels and Masonite. The Plywood House, with its seemingly cantilevered porch roof (it was really hung from the roof trusses), was completed in 1940; the Masonite House was completed in 1944.<sup>11</sup>

### October 2009

**[13] CWA Monthly Meeting** @ bulthaup: 165 West Chicago Avenue. Join us for cocktails and networking 5:45-6:15pm. Meeting 6:15-7:15pm. All members are welcome!

**[21] CWA Lectures Series** @ The Art Institute of Chicago, Fullerton Hall: 111 S. Michigan Avenue. 6:30pm. co-sponsored by the Architecture & Design Society at the Art Institute, Farshid Moussavi.

**[27] 5 Minute Speed-Mentoring for Designers** @ Archeworks: 625 North Kingsbury St. 6:00-8:00pm. Continued drinks at Reza's Restaurant, 432 W Ontario. Co-sponsored by the Archeworks Alumni Organization. RSVP as a Mentor or Mentee by Tuesday, Oct 20 to speedmentoring@archeworks.org. See [www.cwarch.org](http://www.cwarch.org) for additional information.

## [Events]

### Happy Hour & Tour at theWit Hotel



Many thanks to Jackie Koo for showing us around. Thanks also to Mindy Viamontes, Rachel Branagan and Charlene Andreas for arranging the tour and cocktails.

Raymond was elected to become a Fellow of the American Institute of Architects in 1961. Her election was based on her prolific body of work over 50-years of practice. Raymond was never an imitator. She solved complex architectural problems involving the integration of aesthetics, technology, livability and materiality with inventiveness and creativity. Ultimately, Eleanor Raymond's groundbreaking career contributed to and informed many of today's architectural concerns.



Plywood House, Raymond, 1940

<sup>1</sup> Torre, Susana, Editor. *Women in American Architecture: A Historic and Contemporary Perspective*. New York: Whitney Library of Design, 1977. pg. 90.

<sup>2</sup> Cole, Doris. *From Tipi to Skyscraper: A History of Women in Architecture*. Boston: I Press Incorporated, 1973. Pg 81.

<sup>3</sup> Ibid. Pg 80.

<sup>4</sup> Cole, Doris. *Eleanor Raymond: Architect*. Philadelphia: The Art Alliance Press, 1981. Pg 19

<sup>5</sup> California Solar Center, Solar Thermal History, search William J. Bailey, [www.califoniasolarcenter.org](http://www.califoniasolarcenter.org)

<sup>6</sup> <http://web.mit.edu/murj/www/v15/v15-Features/v15-f3.pdf>

<sup>7</sup> Ibid. Pgs. 42, 32.

<sup>8</sup> Simon, Maron J., Editor. *Your Solar House*. New York: Simon & Schuster, Inc. 1947. Passive solar home designs by Ruth Reynolds Freeman, (pg. 33) and Victorine Homsey, (pg. 47)

<sup>9</sup> Cole, Doris. *Eleanor Raymond: Architect*. Pg. 42

<sup>10</sup> M.I.T. School of Architecture and Planning, <http://libraries.mit.edu/guides/subjects/architecture/architects/solar/solardover.html>.

<sup>11</sup> Cole, Doris. *Eleanor Raymond: Architect*. Pgs. 42, 32.

#### Additional Resources

Allaback, Sarah. *The First American Women Architects*. Urbana: University of Illinois Press, 2008

"A Thousand Women in Architecture," *Architectural Record*, 105 (March 1948): 105-113.

"Test House Heated Only By Solar," *Architectural Record*, 105 (March 1949): 136-137.

"M.I.T. Builds Solar Heated House," *Architectural Record* 105 (April 1949): 135-138.

"M.I.T. Solar Decathlon Team", *M.I.T. Undergraduate Research Journal (MURJ)*, Husman, Diana, Vol. 15, Spring 2007.

U.S. DOE Energy Efficiency and Renewable Energy, [www1.eere.energy.gov/solar/solar\\_time\\_1900.html](http://www1.eere.energy.gov/solar/solar_time_1900.html)

University of Wisconsin, [www.uwsp.edu/cnr/WCEE/keep/NR735/Unit\\_1/Timeline.htm](http://www.uwsp.edu/cnr/WCEE/keep/NR735/Unit_1/Timeline.htm)

Dwell Magazine, <http://www.dwell.com/articles/the-wayback-machine-your-solar-house.html>

Permission to reprint photos of the Cleaves House, Raymond House, Plywood House and Dover Sun House elevation and plan all courtesy of the Francis Loeb Library, Harvard University Graduate School of Design, [http://www.gsd.harvard.edu/loeb\\_library](http://www.gsd.harvard.edu/loeb_library)

## [Firm Perspectives]

### Focus on kbh architects

by Kim Haig

Kim Haig recently founded her own firm, kbh architects, Ltd. after working almost twenty years at another firm, Styczynski Walker & Associates, in the western suburbs. Although the move was precipitated by a layoff after a huge slowdown in work at her former firm, Kim had been planning and working towards the goal of starting her own firm for two years prior to that day. So rather than being upset about being laid off, Kim took it as a sign that this was the right time to begin her business, and so it has been. Most of the builders and client contacts Kim had been developing over many years chose to continue working with her, providing a steady stream of work in an otherwise challenging economic environment.

Kim earned her BEDA, a four year architecture degree, from NC State University, and then finished up her fifth year BArch at the University of Tennessee. When Kim moved to Downers Grove in 1991, she sought out work close to her home to make it easier to take care of her new family. In fact, Kim took and passed the test for her architectural license when her first son was just three months old, knowing that life could only get more hectic and that she better get it right the first time! Since becoming licensed Kim has focused on residential architecture, finding that much more rewarding than commercial work.

"Though residential work tends to be the poor cousin in the architectural world, both from a financial and status perspective, I really enjoy solving people's problems, and find residential work more personal. It can be challenging dealing with a client's quirks at times, but providing them with a solution that they love makes it definitely worth the potential aggravation.

This house that I designed for an artist and her husband in Wheaton is just one example of the rewards of dealing with a challenging client. I had to churn through a number of plans, exploring many options for the client, before we settled on a plan that worked for her. I know this can also happen in the commercial world, but I love the fact that I'm able to provide a personal haven for clients, a clearer sense of what home should feel like.



A contemporary home Haig designed in the Fallingwater subdivision in Burr Ridge



Side entry of the home in Wheaton, Elevation.

The catchphrase for my business is "design that works", and I really feel that my plans express that ideal. If a design doesn't function properly as well as look beautiful or blend harmoniously into its environment then it fails to uphold my ideals. Often my clients don't know what they want or what will solve their problem, and that's part of the fun, figuring out the "design that works".



Front elevation of the home in Wheaton. The wide raised porch and cedar siding help ground the house in the neighborhood

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## [Calendar of Events]

Confirm dates, times, and locations with the sponsoring organization. RSVP to all events by emailing [RSVP@cwarch.org](mailto:RSVP@cwarch.org)

### September 2009

**[08] CWA Monthly Meeting** @ bulthaup: 165 West Chicago Avenue. Join us for cocktails and networking 5:45-6:15pm. Meeting 6:15-7:15pm. All members are welcome!

**[25-26] AIA Women's Leadership Summit** @ Wyndham Chicago: 633 N St. Clair St. \$249 for AIA/CWA Members, \$299 for non-AIA/CWA Members

**[29] CWA Fall Member's Reception and Panel Discussion** @ Steelcase Showroom: Merchandise Mart, Suite 3000. 5:30pm for cocktails, 6:15pm panel discussion. Featuring Catherine Baker, AIA | Donna Robertson, FAIA | Carol Ross-Barney, FAIA | Sarah Dunn | Elva Rubio. Moderated by Deirdre Colgan. Free for members, \$10 for non-members.