

Catharine Beecher's Home Designs and Environmental Control Concepts

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ABSTRACT: *In the middle decades of nineteenth century United States, different types of dwellings were largely advertised as model homes and great attention was brought to cottages and residences proposed by pattern-book authors. Through their variations of designs and suggestions, they contributed to the American fondness for domestic architecture. The improvement of the house raised discussions about women's role in home management, and before limited suggestions about everyday household reins, women began to write about Christian family idealizations and how the household should be managed. The following article is a comparison between the designs of Catharine Beecher and the ones of famous pattern-book authors of her time.*

Keywords: *Catharine Beecher, 19th century American domestic architecture, environmental controls.*

INTRODUCTION

During the first half of the nineteenth century in the United States, comfort as a mean of personal well-being was still very much related to the one found in the "model home"—"an environment that protected the respect for order, self-sufficiency, and spirituality Americans held in common, without imposing on the freedom of each individual and each family to live as they pleased" [1].

Different types of dwellings were largely advertised as model homes and great attention was brought to cottages and residences by many pattern books such as Alexander Jackson Davis's *Rural Residences* (1837), Andrew Jackson Downing's *Cottage Residences* (1842), Samuel Sloan's *The Model Architect* (1852), and Calvert Vaux's *Villas and Cottages* (1857). In general, these books included floor plans, details, and perspective drawings along with the assurance that the reader would accomplish the perfect home. However, a female author was more concerned about the physical comfort of the people who were going to inhabit those so-called model homes. Catharine Beecher, with her *Treatise on Domestic Economy* (1841) and later, and better detailed, *The American Woman's Home* (1869), described how to achieve appropriate lighting, mechanical heating and ventilation, and economy of construction within the domestic built environment and its management. As author, educator, and organizer, Beecher's accomplishments have been well recognized in the field of women's education and feminist studies. Despite the success of those two publications, as well as the fact that

she was one of the most influential women designers of her century, Beecher has been considerably neglected and rarely mentioned by architectural historians. The importance of environmental controls and their incorporation into the building design are commonly disseminated among architecture schools, yet topics such as these are neither taught nor mentioned in many of them. No comprehensive study of Beecher's mechanical designs has been found, some suppositions are accepted, but not proved, and many theories and concepts still remain without supporting research.

In 1869, Catharine Beecher presented a type of house whose difference lies in what may be the first "conception of a unified central core of services" [2], which includes water closets and heating and ventilating equipment. With recommendations on how to obtain the most of natural light and adequate heating and ventilation, her ideas improved--with originality, efficiency, and some sort of sophistication--the planning and design of the "Christian house". In her own words Beecher defines the Christian house as "a contrived for the express purpose of enabling every member of a family to labour with the hands for the common good, and by modes at once healthful, economical, and tasteful, whose aim is to exhibit modes of economizing labour, time, and expenses, so as to secure health, thrift, and domestic happiness to persons of limited means, in a measure rarely attained even by those who possess wealth" [3]. Focusing on the environmental controls of heating and ventilation, this study examined Catharine Beecher's designs as she moved to new levels of

significant technological innovations and details worthy of comparison to some of her contemporaries.

THE MODEL HOME

Until the late eighteenth century, Americans would rather spend on furnishings and other durables for the house, than on architectural comforts of heating, lighting, privacy, and hygiene. Not until in the 1830's did architectural comfort begin to be mentioned by American architects in relation to the cottage [4]. During those years, numerous cottages were promoted as model homes, which accounted for being the foundation of a family's power and growth and the right home environments. The cottage, a specific and appropriate to the United States kind of house, is considered to be a great impact on the architectural character of the nation as well as the mainstream of American architecture during the first half of nineteenth century [5].

A. J. Davis Essential information for the American cottage builders was obtained from English architectural publications. Alexander Jackson Davis (1803-92) was the first American architect to publish a cottage design in his house plan book *Rural Residences* (1837). It contained a variety of building types including plans, elevations and perspectives, cost estimate, and summary of materials and construction, which set the book apart from the conventional builder's manuals. Davis's views on architecture launched new attitudes related to the character and function of the American house. In one of his most important designs, the gatehouse of Blithewood estate, Barrytown, New York (Fig.1), Davis introduced to American architecture of mid nineteenth century two major innovations: the vertical board-and-batten siding technique and the word "cottage" itself, for it was the first house design to be published as cottage.

A. J. Downing The work of A. J. Davis was followed by several other additional house pattern books, including those by horticulturist and landscape designer Andrew Jackson Downing (1815-52), "one of the most influential American architectural writers of the nineteenth century" [6]. In his "most popular architectural work" [7], *Cottage Residences* (1842), the designs were primarily dedicated to domestic architectural principles, expressions, and associations to quality of life. Although many of his ideas were taken from English picturesque designs of Gothic and Italianate styles, Downing had the preoccupation of adapting everything to American social and financial needs, climate, and materials [8]. He was also concerned about the economy and efficiency of the domestic arrangement, since he advocated the use of mechanical devices, sanitary conveniences, and domestic labour-saving equipment. However, his plans did not indicate sufficient details of those recommendations (Fig.2 and

Fig.3). His suggestions regarding a comfortable and healthful house were more related to careful planning, considerations to proper orientation, and usefulness of the site best views.

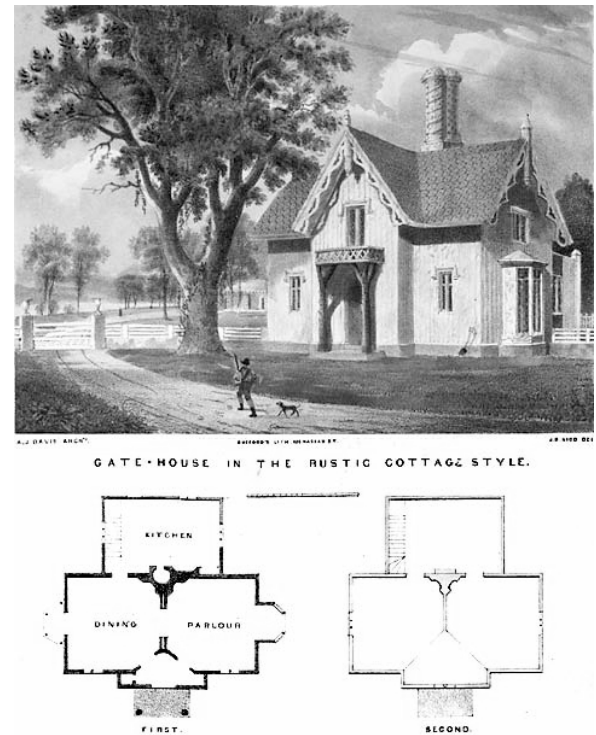


Figure 1: "Gate House in the Rustic Cottage Style", the Blithewood gatehouse, from A. J. Davis's *Rural Residences* (1837).

Sloan As many of the plan books, the two books previously mentioned were not primarily oriented to the builder but to wealth clients willing to build their rural home. *The Model Architect* (1852), by Philadelphia architect Samuel Sloan (1815-84), covered a broader range of building types, as well as relevant technical data to be used by and to guide the builders. On the construction of a comfortable and convenient house, Sloan described the best available methods including house mechanics of warming and ventilating. The level of detailed technical information of his house tables and plates (Fig.4) lacked graphically. Nonetheless they were compensated by elaborate drawings and specifications of certain construction techniques sufficient to allow experienced builders and carpenters to execute them.

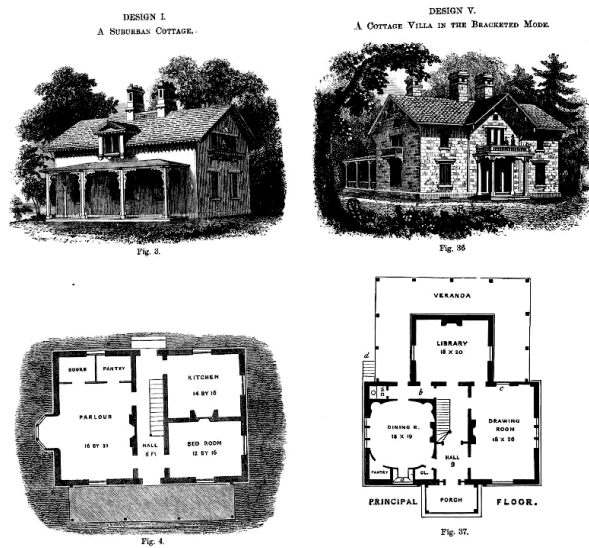


Figure 2: "A Suburban Cottage" and "A Cottage Villa in the Bracketed Mode". Designs I and V from A. J. Downing's Cottage Residences (1842).

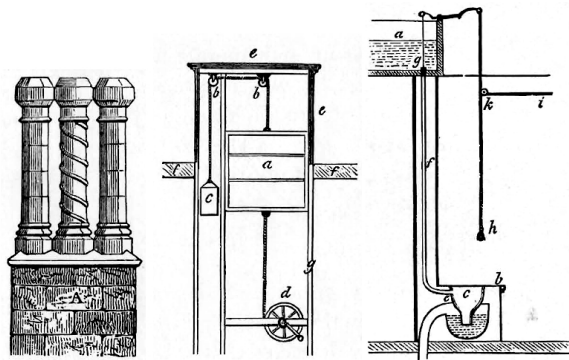


Figure 3: Chimney shafts, dumb waiter, and water-closet from A. J. Downing's Cottage Residences (1842).

Vaux With the growing demand for country homes and cottages around the country, the publication of pattern books grew vigorously in the second half of the nineteenth century. In addition to the established Gothic Revival and Italianate inspirations, other architectural styles were introduced such as the French-inspired mansard roofs (Fig.5) by English architect Calvert Vaux (1824-95), published in his *Villas and Cottages* (1857) [9]. He pointed out the relationship between design and site location, different types of walls and roofs, and the necessity of proper ventilation and drainage. Although his design principles and construction skills were emphasized, Vaux's plans and details did not stress knowledge of heating, ventilating, plumbing, and lighting technologies [10]. Within the entire volume, the only technological details presented were room arrangement plans with suggestions on door opening

directions to avoid draught, plumbing systems for water closet and well, and a chimney shaft with ventilating flues.

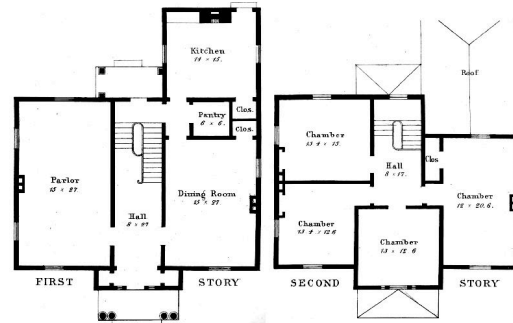
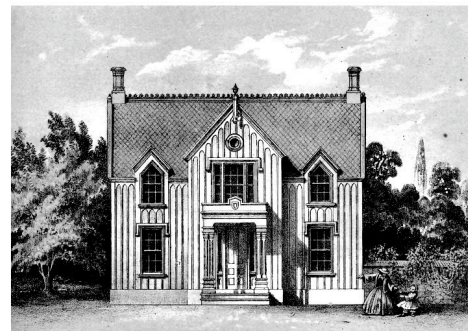


Figure 4: "Design for a Cottage". Design XII, Plate LIV and LV from S. Sloan's The Model Architect (1852).

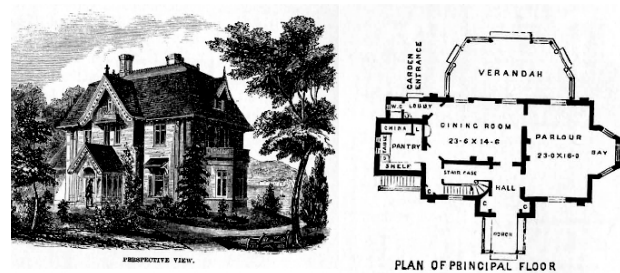


Figure 5: "Model Cottage". Design VI from C. Vaux's Villas and Cottages (1857).

Through their variations of designs and suggestions, architects and architectural writers contributed to the American fondness for domestic architecture. Interested in the most popular housing styles of the middle of 1800's, Americans were also trying to express their moral and political ideas. Therefore, in the 1840's and 1850's the Gothic Revival, for its vertical leading lines and religious background, was chosen by many Americans as the most suitable architectural style to symbolize the importance of the Christian home and the family.

Focusing on the improvement of the house in every aspect, architects and social reformers directed their efforts towards the domestic environment and its

functions, which raised discussions about the role of women in the management of the home. When it came to give specific information on how to run the house, women could not find much from the available advice manuals, which contained limited suggestions about the everyday household reins. Consequently, women began to write for and to themselves about Christian family idealization and how the household should be managed.

CATHARINE BEECHER'S HOME DESIGNS

Catharine Beecher (1800-78), considered to be the most influential author and educator of her time, wrote extensively about women's roles within the domestic realm by relating education to domesticity. In her conception, "the purpose of reforming architecture was to provide a clean, easily maintained environment where families could live healthy, well-ordered lives" [11]. A conception she could share with other women through her several publications, including her two major successes *A Treatise on Domestic Economy* (1841) and *The American Woman's Home* (1869).

The First Designs In *A Treatise on Domestic Economy*, through thirty seven chapters, Beecher argued for female self-sacrifice, right management of the home, and household consumption. According to herself, "The use of superfluities, therefore, to a certain extent, is as indispensable to promote industry, virtue, and religion as any direct giving of money or time" [12]. The book was "an immediate, popular success, running through yearly editions, adopted as school text, a classic" [13]. In chapter five, "On the Construction of the House", Beecher praised the "economy of labour, economy of money, economy of health, economy of comfort, and good taste" [12]. Her spatially and technically conventional plans of cottages and mechanical designs vary from modest house arrangements in Greek and Gothic Revival façades to false doors, fireplace and mantels, and plumbing system for hot water bathing with indication of proper location in the house (Fig.6).

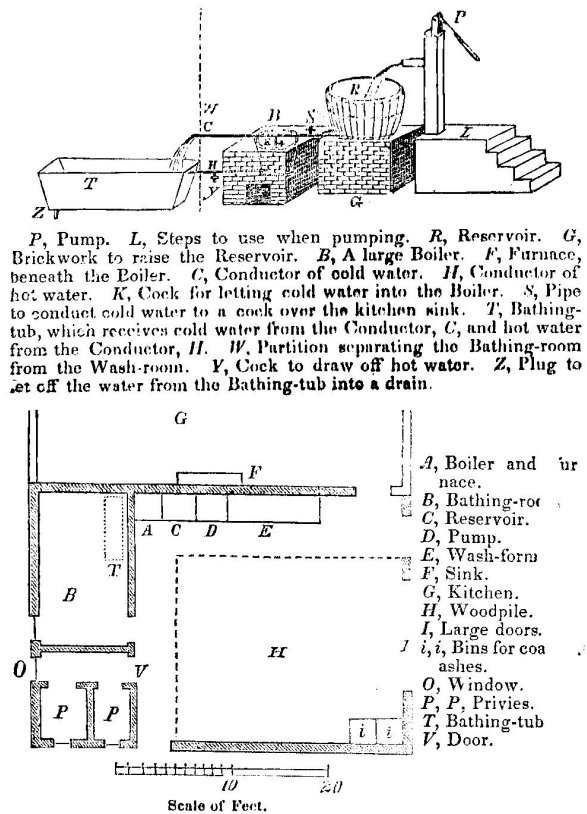


Figure 6: Plumbing system and location plan (A, C, D, and E in the lower diagram represent the water pump area) from C. Beecher's *A Treatise on Domestic Economy* (1841).

Improving Design Skills Between the years of 1865 and 1867, Catharine Beecher published some articles that showed clear improvement of her design skills. She presented elaborate designs for a Gothic cottage thought to be constructed on the "democratic and Christian principles" of bright and comfortable rooms to alleviate woman's work [14]. According to her, the house squared form, orientation (to the South), openings, and stove location and use were intended to secure natural light and proper warming and ventilation.

Beecher used to make the connection between good health, religion, and social behaviour by writing about the importance of both ventilated rooms, in order to have fresh air, and the danger of being exposed to carbon monoxide. As she herself explained, "No room can be thus emptied until in some way a current of fresh air is made that will carry off the air which is deprived of oxygen and loaded with carbon acid" [15]. The plans and details of the proposed "well ventilated house" illustrated the continuous process of introducing fresh air into the rooms (Fig.7). Beecher also wrote about the relationship among wealth, poverty and religion, by making some suggestions to those of "more limited means" [16]. She stated that the designs intended to be for wealthy people who would raise their children in

comfortable and elegant Christian domestic settings. For that reason, she also proposed dwellings where families could live together and share the household maintenance in more economical manners.

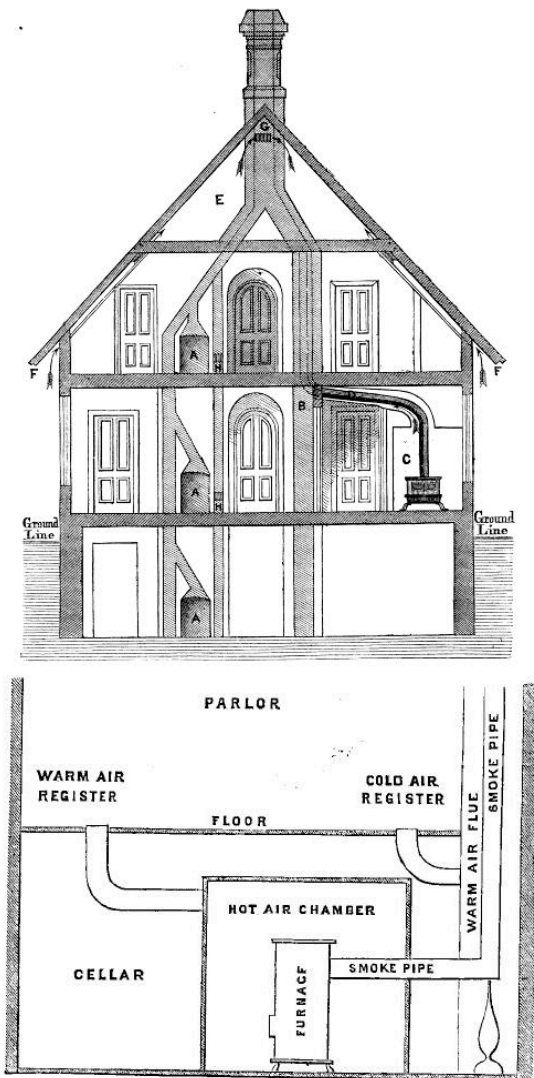


Figure 7: Sections of "the mode of warming and ventilating" and "Stove close". "... all the large rooms have fire-places at A, and a flue connecting with the stove flue B. ... All these flues unite in one chimney..." from C. Beecher's *The American People Starved and Poisoned* (1866).

The Model Christian Home *The American Woman's Home* (1869), co-authored with her sister, Harriet Beecher Stowe, was a great success among domestic text books of the time. It was an updated assemblage of her previous works. When the book was published, the market was already full of books about domestic care. The main reasons why the book was so popular, and it has been reprinted until nowadays, were: the notoriety of the Beecher sisters, the relatively affordable price, and the fact that it was advertised as both home reference

book and school textbook. The difference from its antecedents laid on the technological suggestions and details provided by the authors [17].

Combining issues such as women's roles, housing design, and household organization, Beecher presented a fully developed house plan of a mechanical core with water closets and heating and ventilating equipment (Fig.8). The kitchen and "stove-room" designs illustrated the connection between the chimney and the stove, which, according to Beecher, was designed following scientific principles to combine "convenience, comfort, and economy in a remarkable manner" [18]. The "model stove", based on elementary principles of thermodynamics, was claimed to function better than the current ones because of the oblique firebox shape, which could evenly spread the heat around the equipment. The specific heating and ventilating designs provided by Beecher were intended to improve efficiency, organization, and economy of one's daily life, in particular women's. Unusually combining traditional forms and new technologies, the designs were considered suitable for Christian communities. The house plans were redesigned and inspired in seventeenth-century Puritan units and available nineteenth-century environmental control technologies [13].

CONCLUSION

By looking at the pattern books of the 1840's and 1850's and Catharine Beecher's designs, one similarity can be identified: they all saw in the cottage the perfect place for Christian families. The treatment of the cottage theme by authors like Andrew Jackson Downing and others, with sophisticated plans and ornamented views and details, was that of much decorative elements and aesthetics concerns rather than efficient technological advice.

Beecher's house plans were designed to be economical to build and keep warm. Different from the pattern-book writers, she was not very much concerned about the house aesthetic qualities but with its environmental controls efficiency that would save the Christian woman time, money and labour. Considering the fact that she was not a trained architect, Catharine Beecher's technical designs may have been considered by some to be inferior to those of large scale buildings; however they were much more superior to the available housing design technologies supplied by male architects and builders of her time.

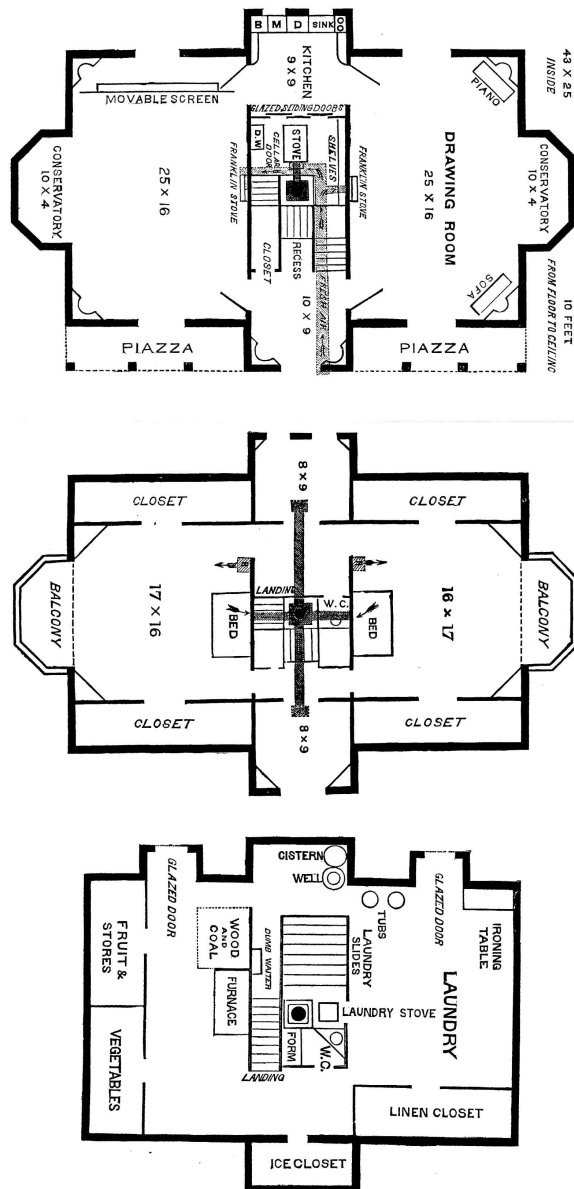


Figure 8: Floor plans of Gothic dwelling, “the model Christian home”, from C. Beecher’s *The American Woman’s Home* (1869).

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