

EVOLUTION OF DOMESTIC KITCHEN DESIGN: INFLUENCE OF DISEASE THEORY AND THE CHANGING ROLE OF WOMEN

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Abstract

In the late 1800s negative effects associated with the Industrial Revolution and subsequent urban crowding led to increased health problems and disease transmissions. This interdisciplinary study analyzed how domestic kitchen design was influenced by concerns for public health, the changing role of women, and Victorian disease theory that centered on sanitation and germs. The role of women changed during this time period from being the manager of domestic servants to becoming the provider of domestic service for their families. Public health officials advised the housewife on the best ways to maintain family health and viewed the healthy home as a means to prevent the spread of disease. No room saw more change to improve health than the kitchen. These changes were seen in overall kitchen design, furnishings, and finishes. This review of the history of kitchen design through a multidisciplinary perspective provided insight into how design concepts evolved and gave a beneficial example of an historical study to educators who desire to convey to students the importance of a comprehensive design perspective.

Introduction

There has been a renewed interest in the effects of social determinants of health on the well-being of modern populations (Commission on Social Determinants of Health, 2005; Marmot, 2005). The notion that environmental and social factors influenced health was a common belief to those who lived in the late 19th and early 20th Centuries. This principle led to social changes that improved the environment and reduced the incidence of infectious diseases. Domestic kitchen design was the focus of this study due to its significant role in protecting families from infectious diseases. Many factors influenced the evolution of domestic kitchen design as

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illustrated in Figure 1 (Moody & Vineyard, 2007). This article is an historical analysis of the reciprocal effects that health determinants had on the design of the domestic kitchen and health of the population during the Industrial Revolution. In addition, consideration is given to the influences of industrialization, the changing role of women, domestic science, and food safety on kitchen design.

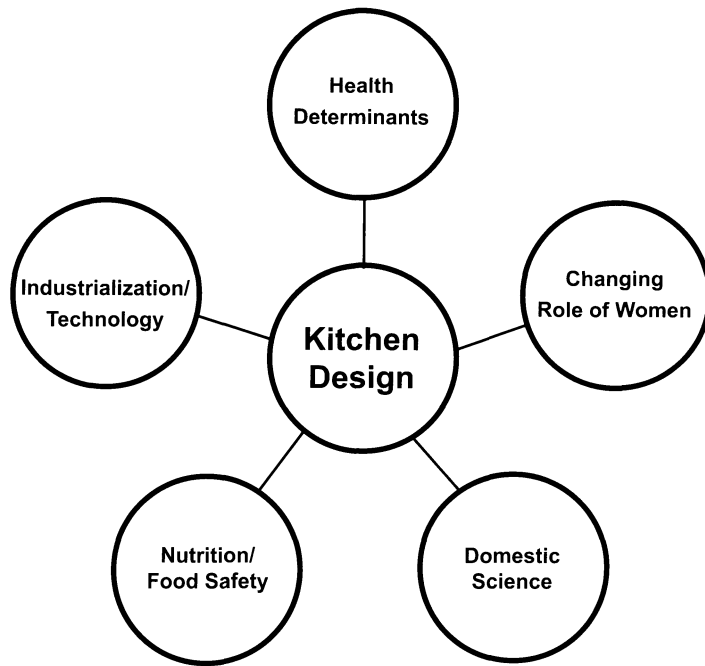


Figure 1. Influences on Kitchen Design Model
(Moody & Vineyard, 2007)

A high rate of infectious diseases during the Victorian period resulted in low life expectancy and high infant mortality rates. Theories on the causes of disease focused on sanitation problems and germ transmission. These theories influenced Victorian thinking that many social elements might bring disease into the home. External sources included contaminated air, outside business vendors, and immigrants, especially those employed as domestic servants by wealthy and middle class families. Inside the home, the fear of germs created an obsession with cleanliness and a phobia against dust. The reactions to these health determinants changed the role of women in the home and altered the kitchen environment forever.

Background

Today much attention is given to the influence of social determinants of health on health inequalities throughout the world. The World Health Organization (WHO) has established a Commission on Social Determinants of Health (2005). The belief that social and environmental factors have strong implications for health and prevention of disease is not new (Frank & Mustard, 1998; Siegler & Epstein, 2003). The founding principles for public health programs were based on the theory that changes in the environment, both public and private, would prevent and/or treat disease. McKeown (1976) postulated that most of the reduction in mortality in the 19th Century was a result of changes in living conditions and food supplies. An epidemiological perspective on health maintains that in order for a disease to spread it must have three components: an agent, a susceptible host, and a suitable environment (Thisted, 2003). Environments are affected by such factors as income, occupation, housing, family organization, social structure, and education (Jack, 2005; Marmot, 2005). Some argue that these factors can be the greatest determinants for the incidence and outcome of diseases (Tate & Smith, 1986).

Disease Theory in the Victorian Era

By the turn of the 20th Century infectious diseases accounted for 44% of deaths in the U.S. (Cutler & Miller, 2005). The most common of these infectious diseases were tuberculosis, smallpox, yellow fever, cholera, influenza, pneumonia, diphtheria, measles, scarlet fever, and whooping cough. In addition, many deaths were due to gastritis and enteritis caused by contaminated milk, water, and food (Lee & Estes, 2003).

In the 19th Century the “Miasmatic Theory” dominated as the primary cause of disease (Cutler & Miller, 2005). Miasma, defined as a polluted environment, referred to the stench associated with rotting organic matter (*Mosby’s*, 1998). It was believed that offensive odors of decaying materials transmitted diseases. Poor drainage and ventilation of dwellings contributed to miasma. In 1842 experts argued for the need to eliminate the causes of these foul smells from housing in order to improve health status (Halliday, 2001; Hamlin, 1995) This theory led to the promotion of improved public and domestic sanitation efforts to fight epidemics (Muck & Brass, 2004).

In the 1870s Louis Pasteur, Robert Koch, and others championed a new theory on disease transmission known as germ theory (Muck & Brass, 2004). The support of this theory led to an obsession with the danger of germs in public spaces, as well as in the home. Rigid standards for domestic cleanliness were created by public health officials for guidance against disease transmission (Wright, 1975).

The science of germ theory promoted a fear of outsiders bringing germs into the household. In the U.S. the campaign against germs created a prejudice against

immigrants and the poor (Handlin, 1973; Wright, 1975). The terror stricken middle and upper classes feared the foul air that came out of the slums and worried that their servants might bring deadly germs into the home.

Health Status and the Industrial Revolution

The Industrial Revolution was distinguished by a strong pride in inventions (Tate & Smith, 1986). Manufacturing and technological advances increased rapidly, dramatically changing the way populations worked and acquired possessions (Bryant, DeWalt, Courtney, & Schwartz, 2003). People of the Victorian era were delighted by technical advancements and industry-developed products. Factories and assembly lines were considered to be model examples of efficiency and many household furnishings, once available only to the elite, became affordable to people of the middle and lower classes (Tate & Smith, 1986).

With the advent of industrialization societies reaped the benefits of technology, but also experienced serious difficulties with health concerns. Pollution from dirt, noise, rotting food, and human and animal waste abounded (Markel, 2003). In particular, the working class struggled with the difficulties of life during the Industrial Revolution. Jobs in factories attracted the rural poor and immigrants to large cities, but housing was inadequate. Because of overcrowding in urban environments, the laboring classes lived in unsanitary conditions, drank polluted water and milk, had limited access to adequate food supply, and suffered infectious diseases caused by ineffective methods of sewage disposal and poor water quality (Lee & Estes, 2003). Sanitary methods to handle distribution of food products were severely lacking. For example, milk was delivered from house to house in open containers and often became contaminated by domestic waste being thrown out upper floor windows (Brogan, 1988). The crude sewer systems of urban areas often overflowed into the same water sources used for drinking and food preparation (Muck & Brass, 2004).

Poor housing and sanitation conditions for the working class contributed to frequent epidemics, high death rates, low life expectancy, and high infant mortality rates (Markel, 2003). Areas of labor class housing referred to as “slums” were associated with disease. Often several families lived together in one room. Dingy narrow streets were rank with the lack of airflow and accumulation of human waste (Muck & Brass, 2004). As a result, one out of every four infants died before its first birthday (Lee & Estes, 2003).

In contrast, the wealthy lived in large homes that relied on servants to maintain the property and the lifestyle deemed appropriate for the upper class. House design and especially kitchen design reflected the use of servants (Massey & Maxwell, 1996). The Industrial Revolution also gave rise to a middle class population that influenced the political and social climate of the time. Middle class families employed one or two domestic servants, usually immigrants.

The role of a woman was to manage her domestic help in order to maintain an ideal home environment. However, the fear of domestic servants bringing germs into the home proved challenging for the Victorian housewife in managing her household staff (Bryant et al., 2003).

While the working class dealt with poor housing conditions, the middle class created environments that were considered safe from the depravity of the city. More active political and social involvement led to recognition that a higher standard of living was needed to improve the health of the working class population. Better food, housing, and clothing, as well as healthier home and work environments were needed to strengthen resistance to disease. Education was essential to help people understand and adopt new scientific knowledge about health care and disease transmission (Lee & Estes, 2003; Silvulka, 1999). This led to new public health movements and a hygiene-focused culture (Adams, 1996; Muck & Brass, 2004). Advances in health and disease prevention were achieved not only in the public health arena but also through improvements in the living environment of the middle and working class (Cutler & Miller, 2005; Marmot, 1998).

Home Design and Public Health

An effort was made to instruct the public on the transmission of disease and the virtues of proper home maintenance (Wright, 1975). Education was seen as the key to improving family health. Houses were believed to cause or contribute to illness. Because no one was positive which theory of disease was accurate, home designs generally tried to cover all disease theory: pure air, pure water, elimination of odors, and high levels of sanitary personal hygiene practices. Doctors were recognized as better designers of healthy homes than architects (Adams, 1996). The home design recommendations of physicians often were centered on the kitchen.

Model houses were displayed at exhibitions to illustrate how scientific law could be used to design “healthy” houses (Adams, 1996). Public health programs sought to rid the home environment from any element that might harbor disease. Dust was considered the main culprit, requiring constant attention (Wright, 1975). It was an enormous problem in the Victorian home due to a combination of oil-burning and gas lamps, soot from coal and/or wood burning stoves, and outside streets that were unpaved (Plante, 1995). All kinds of objects became suspect of germs. Magazine articles warned about germs on library books, telephones, and postage stamps, as well as the use of public laundries (Wright, 1975).

Changing Roles of Women and Servants

Women were designated as the optimal leaders to promote the health of the family and community. They were viewed as the ideal providers of preventive medicine in their role as house managers caring for their family. Domestic science emerged as a field by which women could apply scientific principles to

the home in order to provide for the health of the family. Catherine Beecher was particularly outspoken in promoting a scientific approach to home management (Adams, 1996). Ella Eaton Kellogg in 1892 furthered the concept of the scientific approach to cookery and kitchen maintenance, especially as it related to health. She described the kitchen as a workshop that must be clean and efficiently arranged for optimal work quality (Kellogg, 1892). The fear of immigrants carrying germs led to a plethora of booklets instructing the housewife in the proper training of her servants in scientific approaches to sanitation and nutrition (Kellogg, 1892; Longone, 2004).

A societal crisis was created through two major issues regarding servants: the decision by working class women to leave domestic jobs for higher paying work in factories and the prevailing fear that new immigrant servants might bring disease into the home (Wright, 1975). The Victorian housewife was faced with a new dilemma—she was being moved into a role that she had no desire to assume, yet she painfully knew that to present a home anything less than ideal would diminish the family's standing in the community and risk the health of her loved ones. In this society a woman was measured by the state of her home. Reluctantly, middle class women returned to their kitchens and engaged in the routine chores that before would have been completed by servants (Plante, 1996; Silvulka, 1999). This change in roles stimulated kitchen design improvements (Wright, 1975).

The housewife found that she had a higher calling in the battle against the filth and germs that were believed to cause disease. She was now being called a “professional housewife” and needed an appropriate kitchen environment to match this new role. Ladies magazines referred to the kitchen as laboratory-clean and rationally planned, comparing its organization to that of a hospital (Wright, 1975). The guidance pamphlet *The Well-Planned Kitchen* stated: “The conveniently planned and equipped kitchen saves time and labor for the housekeeper and contributes to the health and contentment of the whole family” (Van Deman, 1923, p. 1). Thus, the loss of domestic help and advances in time management and sanitation technology gave birth to the concept of the modern kitchen.

Kitchen Design

In the early Victorian period the kitchen served as both the living and work space for servants. It was a functional sparse room only utilized by domestic help (Cieraad, 2002). Well into the 20th Century, many kitchens were large, bare, open workrooms equipped with a cooking stove, a worktable, and possibly a sink or drysink, all of which were freestanding pieces of furniture. No cabinetry was found in the kitchen. Instead a pantry dresser was located between the kitchen and dining room in an adjoining butler's pantry. The pantry dresser was a large, built-in cabinet that housed china in the upper portion behind glass doors, flatware

in counter height drawers, and additional lower compartments for other equipment (Bock, 2000; Cotton, 1986).

Although kitchen design benefited from technological advances early in the Industrial Revolution, new tools and equipment were not found in most kitchens until a couple of decades after they were first introduced. For example, many families did not have equipment for refrigeration and stored food in the cellar. Eventually non-electric insulated iceboxes were kept on the back porch or equipped with a door through the kitchen wall that allowed the iceman to deliver ice without entering the kitchen (Wright, 1975). These were later followed by refrigerated storage units in the kitchen but only several decades after the invention of home refrigerators.

With the loss of reliable servants the professional housewife had to be capable of managing the household. New electrical appliances were marketed to be more reliable and efficient than the always difficult household servant and aided the housewife in this management process (Cieraad, 2002). The kitchen became smaller in area to reduce the amount of steps needed by the housewife to perform her tasks (Wright, 1975). Pantry dressers were moved into the kitchen as the formal butler's pantry began to disappear from home designs. The pantry dresser slowly evolved into the modern concept of cabinetry (Bock, 2000) and eventually an efficient, step-saving arrangement of kitchen cabinets, sink, and range created a self-contained assembly-line approach to performing domestic tasks with shelves, sifters, and shakers for every phase of the cooking process (Bock, 2000; Cieraad, 2002).

Many of the factors in the kitchen that contributed to poor health were unseen, including faulty drainage pipes, improperly positioned dustbins, poor ventilation, and toxic building materials. For example, it was determined that arsenic in wallpaper caused bowel inflammation, diarrhea, nausea, depression, asthma, headaches, and skin irritations (Adams, 1996). New finishes were brought into the kitchen geared towards higher expectations of cleanliness (Wright, 1975). Walls, floors, and woodwork were considered more sanitary if they were free from cracks and easy to keep clean (Van Deman, 1923). Walls were covered with washable materials such as tiles, oilcloth, or paint covered with a coat of varnish. Wasteful ornamentation such as wall moldings and wainscotings were removed. Moldings around doorways, windows, and niches became simpler or disappeared all together in order to keep surfaces as smooth and dust free as possible (Friedman, 1995; Wright, 1975).

The ideal floor was crisp white tile. It was easy to clean and did not harbor unwanted germs, insects, or dust; however, it was costly. For those who could not afford tile, linoleum was the next best choice (Plante, 1995). Sanitary counter coverings included sheet metal and linoleum (Bock, 2000), while the ideal kitchen sink was cast iron or was porcelain-lined. Even appliances were covered with porcelain enamel for easy sanitation (Wright, 1975). White

became the prevailing color of sinks and appliances due to its association with sanitation (Cotton, 1996).

Technology was hailed as a woman's new servant. There was a rapid succession of electrical inventions aimed at helping the housewife achieve domestic cleanliness and perform her duties efficiently. For example, many Victorian families utilized commercial laundry services, but the fear of germs associated with unregulated environments influenced the introduction of reliable, affordable home washing machines. Of all the new technological inventions, none had a bigger impact on the fight against dust and germs than the vacuum system. The housewife's ability to conquer dust daily allowed home designers to include large windows in the kitchen, which created cross ventilation and introduced fresh air into the home (Wright, 1975). However, kitchen windows and doors had to be covered with a screen to fight the health menace of flies and mosquitoes (Van Deman, 1923).

Manufacturers used the public's fear of germs to market products. Advertisements emphasized selecting a product based on judgmental values, emphasizing that housewives had a particular responsibility to be good consumers. It was implied that the choices the women made directly affected family health. As an example, producers of washing machines presented their product as having the moral qualities to maintain superior sanitation. The use of certain brands of products was associated with being a loving mother, while others were equal to child abuse (Wright, 1975).

Conclusion

The environment was identified as a major contributing aspect to the well-being of urban populations in the Victorian era. The Industrial Revolution brought to the city not only an endless stream of technological advances, but the unsanitary conditions of urban crowding. The contaminated environment led to frequent outbreaks of infectious diseases. In the early Victorian era beliefs surrounding disease transmission focused on filth, cleanliness, and the importance of both public and domestic efforts towards improved sanitation. The middle class housewife was seen as an important influence on protecting the health of the family and thus the health of the society. As the role of the housewife changed from supervising domestic servants to performing her own tasks so did the work setting of the housewife, especially the kitchen. A scientific approach was applied to kitchen design and use. The innovative technology of electrical appliances was marketed as a housewife's new servant. Great emphasis was placed on sanitation of all finishes in the kitchen and accompanied efficiency of the housewife's time.

Growing awareness of germs and sanitation alongside technological advances of industrialism, transformed the kitchen. The room went from a large, open, sparsely furnished space only for the use of servants to a small, efficient assembly

line complete with a work-triangle, electrical appliances, cabinets with counters, and sinks with integrated drain boards. The hygiene movement and public health concerns that influenced design changes in the domestic kitchen contributed to improved family health and in turn improved health of the community.

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