
Domesticating Efficiency: Lillian Gilbreth's Scientific Management of Homemakers, 1924-1930

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Domesticating Efficiency: Lillian Gilbreth's Scientific Management of Homemakers, 1924–1930

The search for the One Best Way of every activity, which is the keynote today in industrial engineering, applies equally well to home-keeping and raising a family.

—Lillian Gilbreth (Burks and Burks 1925, 50)

Tragedy strikes at the end of the otherwise humorous book and movie *Cheaper by the Dozen* when Frank Bunker Gilbreth (1868–1924), the scientific management pioneer who has applied his philosophy of the “one best way” to all kinds of tasks, dies of a heart attack in a train station phone booth. Not until the sequel *Belles on Their Toes* do we learn how his wife and business partner, Lillian Moller Gilbreth (1878–1972), subsequently becomes the head of the family and saves the couple’s industrial engineering consulting firm from bankruptcy.¹ The Hollywood version of the sequel paints a romanticized picture of how she simultaneously accomplishes these two tasks, emphasizing the ingenuity displayed by her eleven children during her absences (one member of the “dozen” died as a child). As is so often the case with movies “based on a true story,” much of this story was left untold. The rich collection of documents that Lillian Gilbreth left behind indicates that she stabilized her floundering career after Frank’s 1924 death in large part by reinventing herself as a household engineer.² At this

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¹ Frank and Lillian Gilbreth’s children, Frank Gilbreth, Jr., and Ernestine Gilbreth Carey, wrote the books *Cheaper by the Dozen* (1948) and *Belles on Their Toes* (1950). The movies were produced by Twentieth-Century Fox in 1950 and 1952, respectively.

² The Gilbreth Collection (hereafter abbreviated GC) and Gilbreth Library (GL) are both located at Purdue University. The unusually large collection, which contains the N-file (NF) and a restricted file (RF), holds reports, letters, photographs, and other records documenting many dimensions of the Gilbreths’ lives and careers.

critical juncture in her life, the personal question of how to provide for her family became entwined with the technical question of how to earn a living at applying scientific management to the home. She succeeded at both endeavors: within the space of six years, this woman who had never felt at home in her own kitchen became an international leader in the field of kitchen design and a renowned household engineer with a secure financial future.³

How did she do it? Lillian's contemporaries marveled at how this young widow with eleven children could manage a large home and a demanding career at the same time. The mass media credited her character traits, intelligence, scientific skills, psychological stability, and ingenuity. My own research at the Gilbreth family archive has led me to a more complex understanding of how she succeeded. At home, she maintained a household system that enlisted the help of her children and a live-in domestic, and in her career, she adopted homemaking as her subject of study and used her personal story to market her expertise. Her real financial success came when she contracted with companies wishing to sell goods or services to middle-class women. Like many women home economists, nutritionists, and psychologists of her era, Gilbreth contributed to a "scientification" of housework that obligated middle-class women to apply the latest expert advice and household technologies to their own homes. As gender mediators smoothing the interaction between American women and private companies in the 1920s and 1930s, this pioneering group of women experts both introduced homemakers to new timesaving products and outlined new household responsibilities that would absorb the time saved by these new technologies.⁴ In the absence of more radical changes in the way housework was distributed and organized, women of the middle class remained as busy as ever caring for their homes and families (see Cowan 1983).

Thus it is with mixed emotions that feminists today reflect on the contributions of these early women professionals. They may be admired for their ability to overcome enormous professional odds and for serving as positive role models for young women, but one can also speculate on how much better it would have been for women if these early experts had insisted on less rather than more work for women in the home. Critical histories of housework have argued that early housework experts were often unsympathetic to feminism and that, instead of cooperating with feminists

³ See, e.g., Cowan 1980; Trescott 1983, 1984; Bullough 1985; Pursell 1985; Graham 1992, 1997, 1998; Sullivan 1995.

⁴ See Ewen 1976; Ehrenreich and English 1978; Cowan 1983; Goldstein 1994, 1997.

to reduce women's dependence on men, they generally accepted the ideals of the heterosexual, white, middle-class family and ultimately reinforced the tradition of women's subservience (see, e.g., Hayden 1981; Matthews 1987). Only detailed historical research can illuminate how the social context surrounding these women served to discourage any radical impulses they might have had.

By undertaking a real-time exploration of Gilbreth's career development, I attempt to come to grips with how history shaped the career objectives of these women experts while they were shaping the job description of the twentieth-century homemaker. Gilbreth's life experiences during the six years of career uncertainty following her husband's death reveal a restless multiplicity in her gender politics. As a middle-class woman who helped redefine middle-class womanhood, she was caught in the webs of power that she helped to spin. These interwoven webs of patriarchy and capitalism drew her toward particular lines of work and repelled her from others. For example, in the mid-1920s, sex discrimination in the industrial management field combined with financial pressures and motherhood responsibilities at home made it essential that she find nonindustrial sites where she could apply her skills. Rapid changes in the material and cultural dimensions of the middle-class home presented her with a challenging engineering puzzle that she could try to solve without leaving her own family for extended periods of time. Her story offers a rare close-up view of the types of difficult situations faced by many of history's women leaders who exercised a certain degree of influence even while their own interests and actions were subtly, or not so subtly, molded by larger social forces.⁵

The central question facing Gilbreth in the late 1920s was not simply how to re-engineer housewives' motions and mentalities but, rather, how to earn a salary doing it. She found no easy answers. Each audience for whom she attempted to tailor her domestication of efficiency—private firms, home economists, publishers, and housewives themselves—influenced both the form and the content of her contributions in important ways, making the political valence of her projects inconsistent. Throughout her career, she periodically faced the question of whether women should bear complete responsibility for housework and adjusted her answer to fit her audience. The implications of her work for housewives' power over their own labor, a key variable in Marxist feminist thought (Hartmann 1981), also varied as her circumstances changed. For instance,

⁵ Useful models for this project include Evelyn Fox Keller's biography of Barbara McClintock (1983) and many of the biographical chapters in Abir-Am and Outram 1987; Haraway 1989; and Behar and Gordon 1995.

in a 1927 book on homemaking, she aimed to provide (really, to sell) housewives the engineering knowledge necessary to simplify their own work. When she shifted from writing household advice to designing model kitchens in 1929, she began cooperating with companies that were deepening women's dependence on appliances, utilities, and other commodities. Although she disapproved of the promotion of unrestrained consumer spending — what today would be called consumerism — her reasoning was technical rather than political: in her view, consumerism encouraged people to purchase quick fixes in place of acquiring the knowledge and skills necessary to engineer their own intelligent solutions. In her own period of financial insecurity, however, she had little practical choice but to broaden her tolerance for the consumerist agendas of private firms and ally herself with them.

Gilbreth's competing goals and allegiances complicated her gender politics, often forcing her into contradictory positions. Although she often found herself in the company of feminists at conferences and meetings, she refused to regard herself as a feminist and clearly did not see eye to eye with them on many issues. For instance, she often supported women's right to pursue careers, but she also proclaimed that homemaking was as important and satisfying as any career. Although she herself was fortunate to employ at least one servant at all times, she allowed her own biography to be presented as evidence that with adequate knowledge, any wife could manage both home and career. She ignored feminist proposals for collectivized housework that would have allowed other women the kind of dual career she had, yet she offered these women timesaving advice and then suggested a part-time job as a possible way to spend the resulting new leisure time. Although she thought that husbands should take responsibility for the household chores that they found interesting, she believed their greatest service to the family was as breadwinner. As this sampling of her complex position suggests, Gilbreth intervened in ideologies of housework as neither a feminist nor an antifeminist but as a Progressive Era technocrat. In her view, science and technology offered solutions that would render obsolete both the Marxist and feminist agendas.

My account of how Gilbreth domesticated efficiency principles begins with an examination of the skills and knowledge she acquired during her ten-year career as an industrial engineering consultant, followed by a discussion of the cultural contestation of housework during the 1910s and 1920s and previous attempts to bring scientific management home. Gilbreth gave household scientific management a more rigorous technical foundation as well as a new psychological spin in her books, articles, and lectures of 1924–27. Speaking from the platform of a new psychology of

individual satisfaction, she called upon homemakers to study their own physical motions as well as the psychological needs of family members, and she attempted to win over a whole population of women listeners fearful of the erosion of morals and mental health in their families. Gilbreth quickly found that writing advice and giving lectures were poor ways to earn a living. She moved beyond mere words in 1929 and 1930 when she exploited the growing public interest in her personal story and her new reputation as a household engineer to win salaried contracts designing model efficiency kitchens for private firms. Here her personal story and her goal of minimizing women's fatigue became background props for a more exciting and spectacular drama unfolding around new kitchen appliances and utilities. Adapting her domestic engineering and her political sentiments to fit the market for her advice, Gilbreth was able to stabilize her family's economic situation while doing the work she loved, but in so doing she also became an inadvertent advocate of consumerism and existing gender roles. She went on to lead a long, remarkable, and varied career, ultimately becoming known among engineers as America's "First Lady of Engineering" (*U.S. Woman Engineer* 1934; Reynolds 1972).

Gilbreth in scientific management

In addition to several popular press books (Gilbreth and Carey 1948, 1950; Yost 1949; Gilbreth 1970), Gilbreth's newly published 1941 autobiography *As I Remember* (1998) lends insight into the evolution of her professional expertise, conceptual tools, and personal philosophy. She was the first of nine children born to an Oakland, California, couple who could afford to employ several live-in servants. Extreme shyness kept her from beginning school until age nine, but once she started, not even her father's wish that she forsake college could stop her. She excelled academically at the University of California at Berkeley and, like many young women of her background, she especially loved literature and the arts. Her plan to attend graduate school at Columbia University fell through after she moved to New York and discovered that the professor with whom she had hoped to study refused to take women students. Returning to Berkeley, she completed a master's degree in English literature and began doctoral work in psychology. These educational experiences taught her that some instances of sex discrimination could be overcome and others could not. She also learned to be practical: believing that she was not pretty enough to find a husband and marry, she devoted herself to the goal of becoming a university dean. This career plan evaporated in 1904 when she married Frank Bunker Gilbreth, a construction contractor already famous for his

“speed work.” Frank recognized and appreciated her sharp intellect, and they planned a life as partners in business as well as at home, where they hoped to raise six boys and six girls.

This was the same decade in which Frederick W. Taylor and his team of “Taylorite” disciples were using stopwatch time study to revolutionize industrial management practices.⁶ The “Taylor system” of shop management promised to eliminate waste in the industrial trades by subdividing labor into elementary processes, transferring control over work from labor to management, and enforcing standard rates for accomplishing tasks. Excitement about what would come to be called “scientific management” spread throughout the American business community and fueled a growing efficiency craze that upheld science and technology as the solutions for all sorts of physical, psychological, and social problems. From the viewpoint of engineers and business leaders, Taylorism worked because it eradicated haphazard work processes, discouraged loafing on the job, and perfected the flow of information and production throughout the plant. Actually installing the Taylor system, however, required securing the cooperation of workers, a task that proved more difficult than Taylor had anticipated. Although he hoped for a “mental revolution” that would convert labor and management from foes to allies through the shared goal of efficiency, the economic incentives he relied on to motivate workers failed to bring it about and he encountered substantial labor resistance (Noble 1977, 275). Organized labor and neo-Marxists regarded Taylorism as a method for extracting skills from labor and selling them to management, thereby making workers easily replaceable and deflating their bargaining power (see Braverman 1974; Clawson 1980; Montgomery 1987). From this critical perspective, it was scientific management’s ability to “deskil” and speed up workers that allowed it to increase a firm’s profits: business thrived as workers lost job security and suffered greater fatigue from the speedup. The frequent resistance of organized labor to Taylorism made it all the more imperative for consultants to invent ways to spark a real, rather than purely rhetorical, mental revolution on the shop floor.

Frank Gilbreth attended Taylor’s lectures in the early 1900s and showed off his own evolving methods for teaching bricklayers to use fewer and less fatiguing motions. With Lillian’s assistance, he began writing books aimed at systematizing these “motion study” methods. Her special interest was the psychological dimension of work, and by 1912 she had investigated the subject sufficiently to publish in syndication the chapters later compiled as *The Psychology of Management* ([1914] 1953). To hide her gender, the publisher insisted on printing her name only as “L. M. Gilbreth”; this later

⁶ See Taylor 1911; Haber 1964; Noble 1977; Merkle 1980; Nelson 1980, 1992.

inspired Frank to assure inquirers that he was related to this author "only by marriage" (Yost 1949, 213). With assistance at home from servants, from Frank's mother (until 1920), and from other family members, Lillian dedicated herself to completing a Ph.D. in psychology at Brown University. The Gilbreths turned one side of their Providence, Rhode Island, house into an office/laboratory so that, as often as possible, she and Frank could work at home near the half dozen children they already had (Yost 1949, 228–29).

From 1912 to 1914, however, Frank was out of the house regularly, installing the Taylor system at the nearby New England Butt Company. As difficulties with this installation mounted and as Lillian's understanding of applied psychology became increasingly sophisticated, both Gilbreths grew disillusioned with the Taylor system. First, they believed that the time it takes a worker to do a job was an overly crude indicator of real efficiency that disregarded the effects of fatigue on the worker; therefore, the managerial focus should be on motion, not time. Using motion picture technology, they sought to map motion with unprecedented precision and then to eliminate unnecessary movements. Putting Frank's promotional skills to good use, they marketed their service to industrialists by promising to reduce work motions by 33 percent in any trade. They found that impressive statistics, while useful for appealing to management, often merely frightened the workers. This psychological dimension of the management puzzle constituted their second criticism of Taylor: that he had seriously underestimated the impact of psychological variables on work. Their own experience indicated that workers were more cooperative when treated as individuals seeking personal satisfaction from work, so they experimented with various techniques for increasing worker satisfaction. Placing "motions" and "minds" at the center of the "Gilbreth system," they opened their own consulting business to install scientific management in factories and to systematize their methods further through research, summer school courses, lectures, articles, and books (Yost 1949). Every book and virtually every article published under either of their names in the years of their marriage was a joint production (see Yost 1949; Price 1987; Graham 1992). However, due to sexist publishing conventions, Frank's name appeared alone on many of their early writings, and management historians have traditionally given him the credit for their joint work (Layton 1971; Chandler 1977; Nelson 1980).⁷

⁷ Their most influential books include *Motion Study* (Gilbreth 1911), *Primer of Scientific Management* (1914), and *Applied Motion Study* (Gilbreth and Gilbreth 1917). Frank himself attempted "to set the credit right" in a 1921 poem praising Lillian (Frank Gilbreth to Lillian Gilbreth, January 28, 1921, c. 114, f. 0813–14, NE, GC).

The Gilbreths were able to sidestep much of the growing resistance to Taylorism by forging ahead with the very mental revolution that Taylor had failed to achieve, an objective that Lillian would later extend to the home. Her training in psychology and championing of “the human element” ultimately positioned them as leaders (along with Henry Gantt, Harrington Emerson, and Morris Cooke) in a revisionist movement within scientific management (Haber 1964). It was no mystery to her why Taylor’s system drew such heavy labor resistance: his image of the worker as a simpleminded and lazy hedonist prevented him from moving beyond simple wage incentives. Roughly a decade before Elton Mayo’s famous “Hawthorne Experiments” at Western Electric, Lillian Gilbreth made both the psychological attributes of the worker and the social characteristics of the work situation central to modern management (Noble 1977, 271–75). She developed her own understanding of why people work by reading psychology and philosophy and by observing workers in factories and her own children as they worked. Like her contemporary, psychologist Hugo Munsterberg, she considered individuals to be made up of a unique combination of measurable attributes predisposing them to certain occupations. She agreed with Thorstein Veblen (1914) that an instinct of workmanship is fundamental to individual psychology. Combining these insights with the emphasis on learning in functionalism, behaviorism, and developmental psychology, she concluded that people naturally want to derive psychological satisfaction by using their skills productively in work but that each individual’s skills and satisfactions are unique. She smoothed the apparent contradiction between this emphasis on unique individuals and Frank’s dedicated belief in the “one best way” by arguing that for each kind of individual, there is a different “one best way.” The key was to build up workers’ feelings of satisfaction by correctly matching individuals to jobs, minimizing fatigue in the work process, and giving workers personal reasons to work efficiently.

This kind of managerial attention to the individual needs of workers was unprecedented and should not be brushed aside as mere rhetoric aimed at manipulating workers to accept greater exploitation. Frank Gilbreth’s policy of signing contracts with both the shop bosses and the active labor union before taking on a project suggests a genuine and unusual attentiveness to labor (Nadworny 1955, 20–22). More than their competitors, the Gilbreths tried to ensure that the profits created by efficiency would be shared equally and not “all hogged by the owner,” as Frank put it (Yost 1949, 257). Since no management consultant could prevent bosses from cutting wages once an installation was complete, the Gilbreths tried to build intrinsic, noneconomic rewards into the new work standards that could not easily be stripped away. They developed “fatigue study” and

"skill study" as techniques for minimizing physical and mental fatigue while maximizing performance and psychological satisfaction (Gilbreth and Gilbreth 1916b).⁸

To promote the intrinsic rewards of efficiency to workers, the Gilbreths invented a special kind of body time called "happiness minutes" that referred both to the reduced fatigue that efficient workers would experience even while doing greater quantities of work and to the greater enthusiasm workers displayed once they began thinking about their own efficiency challenges (Gilbreth and Gilbreth 1916a). In addition to rearranging work spaces, optimizing bench heights, improving lighting and ventilation, and proposing regular rest periods to maximize efficiency, they devised a whole psychological program, including suggestion boxes, free reading boxes, and a three-point promotion plan to create new happiness minutes and to eliminate any remaining resistance to efficiency. Although there were few opportunities to implement all of these devices and policies in any one factory (Yost 1949, 252; Price 1987), these techniques represented the first practical industrial psychology and sociology as well as a key contribution to modern management (Noble 1977, 275). The psychological dimension also made their system marketable to both management and labor, and they experienced much less labor resistance than did the Taylorites.

The Gilbreths tried out many of their tactics at home before transferring them to industry. In Lillian's words:

We considered our time too valuable to be devoted to actual labor in the home. We were executives. So we worked out a plan for the running of our house, adopting charts and a maintenance and follow-up system as is used in factories. When one of the children took a bath or brushed his teeth he made a cross on a chart. Household tasks were divided between the children. We had three rows of hooks, one marked "Jobs to be done," one marked "Jobs being done" and a third marked "Jobs completed" with tags which were moved from hook to hook to indicate the progress of the task.⁹

They also standardized regular household chores, instituted a bidding system for larger chores, and established reading boxes and a family council, as *Cheaper by the Dozen* recounts (Gilbreth and Carey 1948).

The family's 1920 move to Montclair, New Jersey, strengthened their

⁸ It was Lillian who wrote most of their book *Fatigue Study* (1916b), in which both fatigue and skill were defined and operationalized. Frank found the book "gabby" but tolerable (Gilbreth 1998, 144).

⁹ Lillian Gilbreth, speech delivered to National Federation of Business and Professional Women's Clubs in New York (1930, RF 11, GC).

firm by bringing it closer to New York business circles. In June 1924, just as they were beginning to receive the public recognition that they felt they deserved, Frank suddenly died. This put a premature end to their partnership and threw the family into crisis. With financial pressures lying ahead, Lillian faced the difficult decision of how to organize her personal life: should she take her eleven children and move in with relatives in California or remain in New Jersey and attempt to run the business on her own? After a meeting of the family council, she decided to tough it out among the manufacturers and industrial engineers. She vowed to continue Frank's quest to eliminate unnecessary motion from different kinds of work and to see to it that each of the children graduated from college (Gilbreth 1998, 196–97).

This would not be easy. For a good part of her first six years as a woman in charge of her own firm and family, she “fought to stay on her feet and not worry herself sick while her financial resources dwindled” (Yost 1949, 320–22). Her willingness in previous years to play to cultural expectations by working in Frank's shadow now backfired on her. Lacking faith in her ability to complete an installation without Frank, industrial clients canceled or failed to renew their contracts in 1924, and she found it nearly impossible to attract new ones (Gilbreth 1970, 186–89). At least two engineering clubs invited “L. M. Gilbreth” to speak, only to deny her entry when they found out she was a woman (Yost 1949, 356–57), and the prestigious American Society of Mechanical Engineers was reluctant to admit her as a member because she was a woman.¹⁰

To support her family financially, Lillian began selling her expertise by offering a three-month motion study course twice a year in her home/laboratory, where she could be near her children. She invited private companies to enroll one of their managers for one thousand dollars each (Yost 1949, 320). This temporary solution to her career crisis allowed her to assume the conventionally feminine role of “teacher,” even while she vicariously extended the Gilbreth system into the masculine realm of industry through her students. At the same time, she tried to line up contracts with firms that catered to women, such as department stores and appliance manufacturers, but she found them unwilling to pay for her consulting services.¹¹

¹⁰ In 1925, Gilbreth sent letters to key members of the prestigious American Society of Mechanical Engineers, which had only one woman member at the time, to ascertain its receptivity toward women. She was advised against applying for membership that year because of an “anti-woman feeling” among other members (letters from engineers to Lillian Gilbreth, 1925, c. 131, f. 0830–1, NE, GC).

¹¹ From 1925 to 1927, Gilbreth did consulting work at Macy's department store without contracting for a salary (author's personal conversation with Ernestine Gilbreth Carey, May

One way to transform her gender from a liability to an asset was to apply her skills to the home and become a mediator between the business world and middle-class women. This was not necessarily a “natural” path for her to pursue; although Frank and Lillian had done some motion studies of household tasks, neither of them had ever been especially skilled at or interested in housework.¹² The Gilbreth children have revealed that the family kitchen in particular was a “model of inefficiency” and that Lillian enjoyed handicrafts and parenting but “hadn’t had time, since her marriage, to learn much about cooking” and could make only one dish well (Gilbreth and Carey 1950, 101–4). Even though she was undoubtedly superb at managing the various employees and family members who did most of the housework in her home, it would be inaccurate to describe her as a skilled housekeeper in 1924.

Regardless, the public was beginning to ask that she portray herself as a domestic whiz, and she often spoke to clubs and organizations on the topic of “fatigue elimination in the home.”¹³ While honoraria for these speeches could not pay the family’s bills, the opportunities did teach Gilbreth that the real demand for her expertise was in household engineering. Like many talented women before her, she entered the domestic science field as a refugee from a male-dominated scientific profession (see Rossiter 1982; Matthews 1987, 146–47). She began to learn as much as she could about the situation of housewives to prepare herself for a new specialty as a household engineer.

Modern homemaking in the making

From Lillian Gilbreth’s perspective as a psychologist and engineer, the middle-class home was an inefficient work site undergoing dramatic changes in its personnel, tools, and philosophies. As industrial jobs lured workers away from domestic service and immigration restrictions limited the supply of replacements, affluent housewives of 1920s cities and suburbs were learning to manage their homes without full-time servants

24, 1994). Although she trained General Electric managers in motion study, there is evidence that the company also turned down contracts with her. In both of these instances, the companies were willing to pay her as a teacher but not as an on-site management consultant.

¹² Frank had tried to systematize scientific management principles for the home, writing papers on the subject (Gilbreth 1912a, 1912b) and attending the Lake Placid, N.Y., home economics conference of June 1912 (letters between Frank Gilbreth and home economists, 1912, c. 117, f. 0816–34, NE, GC).

¹³ Lillian Gilbreth, speech transcripts (c. 8, f. 0030–39, NE, GC). The records leave it unclear whether she was paid for these speeches.

(Cowan 1983, 120–26).¹⁴ With only occasional part-time or hourly domestic help available, wives whose mothers might have managed a staff of domestic workers were often left to perform even the most boring and tedious tasks themselves (Palmer 1989, 7–13). Rapid developments in urban infrastructure, especially the introduction of hot and cold running water and electricity and a wide array of new household appliances, were reconstituting the home's physical terrain as well as the skill requirements for housework (see Strasser 1982; Matthews 1987; Palmer 1989). Laura Shapiro remarks that “between World War I and the Depression the day-to-day work involved in cooking and cleaning changed more dramatically than it would again for another half century” (1986, 222).

Although the middle-class home clearly presented many interesting engineering problems, it was not at all clear who would be willing to pay Gilbreth to tackle them. Without servants, the management/labor distinction no longer existed in most homes, and Gilbreth's tactics for marketing her services required creative revision. She somehow needed to appeal to housewives as both managers and workers, impressing them with the time and motion they would save and the heightened satisfaction and sense of purpose they would enjoy from becoming efficient. If she wanted to earn a living by domesticating scientific management, she would also need to appeal to those large organizations that had some financial stake in managing housewives. In the 1920s, as she entered the fray of those who were competing to define modern homemaking, she found that the existing discourse made certain kinds of arguments or suggestions seem rational and others irrational. The “language game” (to use Wittgenstein's term [1953]) surrounding the modern home was shaped largely by patriarchal and capitalistic patterns of thought and action. Each strand of this discourse carried its own implications for both middle-class women's power over their labor and the extent to which housework should be regarded as their responsibility.

Because it was widely believed by 1920 that women were responsible for 80–90 percent of household spending, marketers of utilities and appliances often targeted middle-class women.¹⁵ Private companies competed

¹⁴ By 1924, e.g., the vast majority of business-class women in Muncie, Indiana, were doing more than four hours of housework per day, and the practice of hiring full-time servants had dropped by 50 percent since 1890 (Lynd and Lynd 1929, 168–69; Caplow et al. 1982, 363). The long-standing and frequently bemoaned “servant problem” stemmed from changing immigration rates along with ethnocentric and racist orientations toward those individuals (often married women of color) who were still willing to do domestic work (Romero 1992).

¹⁵ As one might expect, people of color and those who could not afford most of the household technology necessary to modernize their homes were generally excluded from this

fiercely to make the consumption of particular tools and services seem like the natural and obvious solutions for overwork. Advertising firms and women's magazines were growing into substantial and interdependent cultural forces during these years, with advertisements overshadowing the household advice in magazines such as the *Ladies' Home Journal* by the middle of the 1920s (Hayden 1981, 274; Scanlon 1995, 43). The new commodities for sale ultimately would displace the craft traditions that had been integral to housework in previous centuries, rendering housewives more dependent than ever on commercial goods and the dollars necessary to buy them.

When convenient, participants in this cultural debate exploited the rhetorical power of the feminist case against unnecessary drudgery. Although feminist enthusiasm for the socialization of housework had waned since the 1890s, some of its sentiments lingered in the popular consciousness. Partly in an effort to promote women's economic independence from men and marriage, turn-of-the-century feminists such as Charlotte Perkins Gilman had pushed for more equitable arrangements of domestic work that challenged existing gender roles. Their proposals included multifamily kitchens to centralize food preparation and cleanup tasks, publicly funded day-care centers, cooperative housework service agencies, standardized apartment hotels, and the industrialization of certain household jobs such as laundry (Wright 1980, 56; Cowan 1983, 102–19). Much of the energy for these projects was diverted toward suffrage in the 1910s, although the *Ladies' Home Journal* was still making the case for community kitchens and kitchenless houses as late as 1920 (Hayden 1981, 269).

During the 1920s, popular sentiment turned away from feminist proposals and toward the ideal of a private home with a solitary woman doing the housework. This shift was promoted by the growing profession of home economics, which gained its own national organization and journal in the first decade of the century (Strasser 1982, 206–9). Chemist and pioneering domestic scientist Ellen Swallow Richards had refused to scorn “womanly duties” and recognized that her moderate politics had gone a long way in winning her strong allies (Stage 1986, 216). The next generation of home economists followed this lead by treating housework as women's true profession. Their goal was to ease the drudgery of housework, not to redistribute it. In an era before most products and advertisements were federally regulated, many home economists worked to supply women with intelligent, personal advice about new labor-saving products

collective dreaming (Romero 1992, 53). Modernization was primarily for the white urban and suburban middle class. Although the origin of the 80–90 percent figure is unknown, it appears to have attained the status of fact through sheer repetition.

on the market (Marchand 1985, 34–35). Working as teachers, county extension agents, corporate researchers, and company spokeswomen, they served as gender mediators between organizations and American women (Goldstein 1994). In forums such as home extension demonstrations and radio cooking programs, their female voices helped to chip away at cultural resistance to domestic modernization and consumerism.

Many home economists and other progressives caricatured the “traditional housewife” as unsystematic and haphazard in her work processes. They tried to destabilize a cultural inertia favoring old-fashioned work habits that impeded the introduction of science, technology, and business reasoning into the home. This inertia was a legacy of the early nineteenth-century “cult of domesticity” that had romanticized the home as a sort of moral high ground and “buffer against the harsher thrusts and shocks of progress” (Marchand 1985, 168). Modernization, traditionalists feared, might make the home as impersonal and cruel as the industrial world and thereby endanger the moral education of children.¹⁶ Women had a “moral faculty” that was honed through vigorous training by their elders, not by scientific experts, and a woman’s overwork signified that morality was securely protected in her home (MacFarlane 1991). To break this signification, morality had to be tied to modernity instead. Edward Purinton, an early advocate of household efficiency, tried to forge this association when he acknowledged that “the housewife is the first keeper of a man’s morals” but then suggested that women could find the energy to keep it moral only by turning to the advice of scientists (1916, 421). The older ideal of the overworked housewife was gradually displaced by a more modern vision of “the home-maker,” “home manager,” or “family purchasing agent,” job titles that many competing agents attempted to appropriate and attach to their own particular domestic vision. These new titles promised women at least a semblance of the managerial power that their mothers had had in the days of live-in servants and that many of their husbands still enjoyed in white-collar careers (Palmer 1989, 42).

A decade before Gilbreth added her voice to this public discourse, several household engineers forged an enduring link between home economics and the larger efficiency craze that was sweeping industry. They inherited from earlier generations of domestic advisors such as Catharine Beecher (1841) and Helen Campbell (1897) the notion that what works in business can work in the home (Banta 1993, 233–40). What it meant

¹⁶ A few home economists, such as Marion Talbot and Sophonisba Breckinridge (1912, 42), echoed traditionalists by arguing that efficiency should not be a household ideal because the household’s “purpose is not pecuniary profit” (cited in Matthews 1987, 153).

to run one's home like a business became more specific once scientific management began to dominate industrial work. With Taylor's rhetoric in their corner, household engineers promised to win for housewives the vast savings in time and energy enjoyed by the business sector, and they downplayed the profound differences between industrial trades and housework that made this extension tricky to carry out. Housework was unpaid, unsupervised labor often performed in isolation and in unstandardized work spaces (Strasser 1982, 217; Cowan 1983, 5), and time and motion study methods designed to simplify repetitive, specialized industrial tasks were not necessarily applicable to the mental and physical household tasks of housewives (Berch 1980). Indeed, it is odd that just as domestic servitude was becoming less common, a set of principles and methods designed for managing a large work force should be extended to the home (Hayden 1981). To complicate matters further, there was no accepted measure of the effectiveness of scientific management: the elaborate methods of accounting used in industry were useless in the home, where time and energy did not translate neatly into money.

However, scientific management was not an impossible fit for the home, and some principles actually might have suited the home better than the factory. For example, the time saved in housework really could be converted into new leisure time for the worker, unlike time saved in the factory. Opinions on the feasibility of scientific management in the home varied according to people's understanding of how scientific management worked. Leftist critics who believed that it worked by exploiting labor found its extension to the home nonsensical precisely because a single person, the homemaker, played the part of both worker and manager in the home (see Berch 1980). In contrast, household engineers who believed that the savings generated by scientific management resulted from its elimination of unsystematic work practices saw every reason to strive for comparable savings in the home.

The household engineers who tried to make this extension in the 1910s were quite good at picking out useful managerial ideas and applying them to the household. The first books on the topic, Martha and Robert Bruere's largely anecdotal book *Increasing Home Efficiency* (1912) and Christine Frederick's *The New Housekeeping* (1913), aimed primarily to create public awareness of the possibility of this application. Unlike the Brueres, Frederick ended up building her career on this argument and gained public notoriety in the process. Although she was neither a home economist nor a scientific management engineer, she had read some of Taylor's writings and had toured "Taylorized" factories. In several books and as an editor at the *Ladies' Home Journal* between 1912 and 1919, she pioneered the new

vocation of “household engineering,” calling for a standardization of many household tasks with written instruction cards and schedules. In *The New Housekeeping* (1913), she advised housewives to separate their work as household executive from their work as manual laborer and to do much of the planning well in advance of actually completing tasks (see Strasser 1982, 214–19). Relying on the naked eye and a clock for her own simplified version of time and motion study, Frederick generated bits of advice about how various repetitive tasks might be accomplished more efficiently. For example, in dishwashing, Frederick advised the housewife to place the dish draining rack to the left of her sink and to hold the dishrag in her right hand and the dish in her left hand (overlooking the possibility that the woman might be left-handed). This arrangement would save her a repeated long crossover reach and at least one-third of her work time (1913, 23). Although Frederick advised women to do their own similar time and motion research, she remained vague about exactly how to carry out this research, as Gilbreth noted in the margins of her own copy of *The New Housekeeping*.¹⁷ This style of advice left authority over household work practices in the hands of expert advisors without teaching women to do their own research.

Even in her next book, *Household Engineering: Scientific Management in the Home* (1920), a correspondence course textbook, Frederick relied primarily on experiential evidence and anecdotes to stimulate faith among housewives that they could conquer their drudgery and win more leisure time by embracing scientific management.¹⁸ Like Taylor before her, Frederick’s rather outdated understanding of human beings as instinct-driven hedonists may have kept her from developing a more compelling psychological sales pitch.¹⁹ Two other household engineers of the 1910s who featured scientific management in their books on housework also failed to draw on more recent psychology. Georgie Boynton Child’s *The Efficient Kitchen* (1914) offered the first major treatment of scientific management

¹⁷ The Brueres’ book and copies of Frederick’s books are housed at the Gilbreth Library. The copy of *The New Housekeeping* that Lillian signed and dated August 1913 contains margin notes that reveal her doubts about Frederick’s methods and findings.

¹⁸ The Gilbreths wrote a foreword for the second book commending Frederick for drawing public attention to household inefficiency. Frank’s name alone was signed to the foreword but correspondence reveals that Lillian wrote most of it before either of them had actually read the book (Lillian Gilbreth to Frank Gilbreth, January 9, 1918, c. 112, f. 0813–8, NF, GC).

¹⁹ Frederick had learned the psychology of instincts a decade earlier at Northwestern University, and it was this type of psychology that advertisers (such as her husband, George Frederick, and the readers of his journal, *Printer’s Ink*) and Frederick herself continued to trust and exploit in the 1920s even after most professional psychologists had abandoned it (Baritz 1960, 26).

in kitchen design. Child was a newspaper reporter who had educated herself in home economics at an early household experiment station in Darien, Connecticut. She regarded the creation of an efficient work environment as the necessary first step toward efficient housework and aimed to "awaken constructive interest" in and elevate the status of homemaking (1914, 10). Another woman, Mary Pattison, who headed the New Jersey Federation of Women's Clubs' Household Experiment Station at Colonia, wrote scattered articles and a major book called *The Business of Home Management: The Principles of Domestic Engineering* (1915). This volume covered a vast range of topics, including "the labor-saving kitchen," food preparation, cleaning, laundry, family financing, purchasing, servant management, health, and personal efficiency, and it won endorsements from the highest authorities in the scientific management field, including Taylor. Together, the Brueres, Frederick, Child, and Pattison stimulated popular interest in scientific ways of reducing women's drudgery that would not upset family gender roles, leaving intact the existing division of labor by sex within the home.²⁰

Home economists were enthusiastic listeners (Matthews 1987, 153–54). Although there were no new books on household engineering in the United States from 1920 to 1927, home economists of this era were beginning to borrow phrases such as "economy of time and energy," "standardization of equipment," and "simplified practice" from household engineers (see, e.g., Charters 1926). They nevertheless remained uncertain both about how to do time and motion study and about the appropriateness of extending such methods to the home. In 1925 and 1926 issues of the *Journal of Home Economics*, "science" in the home appears primarily in reference to nutrition and child care: the scientific analysis of work processes remained beyond the abilities of most home economists. Articles describing the Better Homes Week demonstrations in 1925 and 1926 also lacked the kind of scientific attention to appliance arrangement and motion economy that emerged a few years later as a result of Gilbreth's influence (Ford 1925, 1926). Uncertainty about the applicability of scientific management to the home lingered throughout the mid-1920s, ultimately finding its most vocal critic in Hildegard Kneeland of the Bureau of Home Economics, who argued that the small size of the household, the great variety of its tasks, and the broad range of skills and interests demanded by the

²⁰ The circulation of these ideas in the popular press is illustrated by a 1920 story about Mrs. Richard Boardman, who replaced her inefficient servants with a careful home assistant, arranged the housework on a factory schedule eight hours a day, six days a week, and then opened a consulting business in household efficiency ("A Consulting Engineer in Household Efficiency," *New York Evening Post* [1920], c. 87, f. 0655–2, NF, GC).

housewife doomed the application to failure (1928). The fact that Kneeland found the topic worthy of rebuttal, however, shows that household engineers did indeed have an audience within home economics.

The careers of Frederick, Child, and Pattison were limited as long as they marketed their advice only to housewives and home economists. In the late 1920s Frederick moved her career in a more profitable direction by appealing to companies that sought to manage women's household consumption. Using the language of drives and instincts and capitalizing on her insight into "women's nature," Frederick created a niche for herself as an advertising consultant specializing in women. By 1929 she was telling companies how to seduce "Mrs. Consumer," and it was this commercial angle that drove the rest of her career and led her away from the goal of improving housework processes.²¹ At her "Applecroft Home Experiment Station," where she had carried out simple time studies a decade earlier, she now began to concentrate on testing new consumer products for efficiency and endorsing those that passed her tests. In the course of sixteen years, Frederick had gone from treating housewives as hybrid manager/workers to treating private firms as managers and housewives as consumers to be managed. The basis for this new breed of managerial power would be women's deepening dependence on commodities and services for sale.

Frederick's shift in focus from work processes to commodities foreshadowed a larger mutation in the cultural meaning of household efficiency. As Roland Marchand has argued, eventually it was the "look" of modernity more than its substance that was for sale: women would be expected to consume like modernists even if their work processes remained awkward (1985, 168–71).²² It was exactly this trend that Gilbreth tried to reverse in 1927 by focusing attention on the psychology of housework.

A psychology of homemaking: Gilbreth's writings and lectures

From Gilbreth's perspective, household engineers, like Taylor before them, had missed the opportunity to illuminate the full psychological, social, and

²¹ Frederick wrote: "In my belief Mrs. Consumer's mind is an especially unconscious mind" and "the strategy of appeal to women should make frequent and full use of her unconscious self" (1929, 46–47). She noted that instincts such as sex love, mother love, love of homemaking, vanity, curiosity, and cleanliness could all be crafted into good advertising appeals.

²² Ironically, the very appliance manufacturers attempting to profit from comparing housewives to efficient managers often deserved a good part of the blame for the waste of housewives' energy. Until about 1935, these firms seldom carried out the sophisticated investigations of housework processes necessary for designing efficient appliances and coordinating these appliances with one another (Giedion 1948, 612).

moral rewards of efficient work. In the mid-1920s, as she contemplated how to make a living, she found that the household engineers were only marginally useful role models. Although she too could write advice books and magazine articles, she could not earn her primary salary in the ways Frederick and Pattison had. She refused to take the path chosen by Frederick apparently because, despite its financial attractiveness, product endorsement ran contrary to her psychology of individual differences: she believed that the uniqueness of each home and homemaker prevented any single appliance or product from being suitable across the board.²³ Over the course of her long career, she endorsed only a household management desk that she had designed herself and a trade organization representing commercial laundries.²⁴ Instead of promoting particular goods, she often criticized the private sector for failing to provide the kinds of goods and services that homemakers really needed (see Thornley 1930). Managing a household experiment station, as Pattison did, was also impractical for Gilbreth due to her family responsibilities and her lack of credentials in home economics. Her need to remain near home in Montclair, New Jersey, where her youngest child was just starting school, made it impossible for her to take any full-time position. Furthermore, home economics graduates were becoming plentiful by this time, and they would have presented tough competition for Gilbreth, who as yet had no reputation or credentials in household engineering.

To make a career of extending scientific management into the home, Gilbreth knew that she would first have to demonstrate the value of her skills as an engineer and psychologist to homemakers, home economists, and prominent women leaders.²⁵ She had three resources working in her favor that were not shared by her predecessors: practical experience in industrial engineering, doctoral expertise in psychology, and a personal biography as a mother of eleven that made her more intriguing to the public. In 1926 she began to carry out her own sophisticated motion study experiments on household tasks such as making a bed, setting a table, washing

²³ Gilbreth easily could have commercialized her career by doing endorsements for appliance manufacturers. Harrington Emerson, the only other pioneer of scientific management to take an interest in the home, had promoted a particular kitchenette a few years earlier, and there was nothing in the social environment to keep Gilbreth from doing the same (advertisement for Napanee Dutch Kitchenet, April 1921, c. 88, f. 0655-9, NE, GC).

²⁴ Advertisement for Laundryowners National Association of the United States and Canada, *Journal of Home Economics*, August 9, 1926; "The Gilbreth Management Desk," brochure, 1933, c. 0, NE, GC.

²⁵ In November 1924 she lectured at the Garland School (a women's vocational training school) on "Efficiency in the Home," and in December 1925 she spoke at a luncheon of the League of Advertising Women (headed by Frederick) on motion study and the prevention of fatigue (speech typescripts, c. 8, f. 0030-38, NE, GC).

dishes, and baking.²⁶ She calculated that a homemaker could reduce the walking distance during the process of dishwashing, for example, from twenty-six miles to nine miles a year—a more impressive figure than the “one-third” time reduction that Frederick had promised.²⁷ She incorporated these findings into her radio addresses and public lectures on household efficiency, which became more frequent in 1926 after she was named chair of the fatigue elimination committee of the Society of Industrial Engineers.

In her first book on the home, *The Home-Maker and Her Job* (1927), Gilbreth's goal was not to impress readers with statistics but to popularize the psychological and social arguments for household efficiency. This objective, along with the fact that she originally drafted the book manuscript on a ship crossing the Atlantic, explains its nontechnical, conversational style, which incorporates many examples from her own family but ascribes them to fictional families, apparently to protect her family's privacy. Gilbreth began by defining the home as a place that allows for creative, individual expression by each member of the family as well as mental and physical rest (1927, 5–9). She proposed that the manager of the home be called a “home-maker” (still hyphenated in those days) rather than a “housewife” to emphasize “the art, the individual variation, the creative work” of making a home, a realm of new possibilities for women's self-expression (1927, 20). To augment the rewards of the homemaking experience, women needed to learn basic engineering principles as well as applied psychology, which would allow them to address scientifically six key questions: what is to be done in the home (rather than by an outside firm such as a commercial laundry), who among the available workers (including the homemaker and her children) is most interested in the task and best suited for it, where in the home is each task to be executed, when is it to be done, why is it done at all, and, finally, how exactly is it done?

Rather than simply presenting recommendations as her predecessors had done, Gilbreth showed homemakers how to do easy experiments on their own. For example, they could eliminate needless walking by using a simple pin and string method as a substitute for motion picture films. This involved recruiting a child to follow the homemaker around the kitchen

²⁶ Process charts on household tasks, 1926–27, c. 33, f. 0655–7, NE, GC. In an interview, she described her research process: “First, a motion picture is made of the individual at work. The picture is taken to a laboratory and studied at leisure. Then a chart is drawn up to show every stage of the process. From this chart it can be seen whether or not some of these processes may not be cut out altogether” (quoted in Eaton 1926, 330).

²⁷ Lillian Gilbreth, outline of her projects on motion savings in the home, undated, c. 88, f. 0655–8, NE, GC.

carrying a ball of string and leaving behind a trail to record the distance walked and a series of pins marking the points in space where she had turned (Gilbreth 1927, 20–21). Gilbreth must have realized that very few readers would transform themselves into time and motion researchers overnight. Nevertheless, her book won favorable reviews because of the way it demystified the principles of scientific management for homemakers and home economists (*New York Times* 1927). Gilbreth was carving a space for her particular expertise in the professional discourse on the home.

Gilbreth's writings of this period drew new attention to the interaction between the homemaker and her tools. She considered certain forms of technology, some as simple as a well-placed light switch, to be essential: "When you go to your man-designed kitchen in the dark and fan the air wildly as you hunt vainly for the chain to pull the electric light on, only to have it eventually hit you in the face, you have a simple enough problem in the elimination of unnecessary fatigue in the household. Get rid of the waste motion by having a push button at a convenient place in the wall."²⁸ "If household tools are arranged to avoid unnecessary handling, if the ordinary work is routed so that we do not need to 'double back' on our tracks . . . and if we sit at work when we can, we shall all be applying the same principles [of industry] to our own work."²⁹ Small appliances, she insisted, ought to be electrically powered and in good working condition (1927, 135), but, in keeping with her philosophy of individual differences, she did not specify which of these were essential for an efficient home.

Gilbreth knew that diagrams and statistics demonstrating the profit potential of motion study in industry would not persuade homemakers to modernize. Instead, she focused attention on their overworked bodies and portrayed household motion efficiency as the remedy. She ridiculed the older ideal of the overworked, self-sacrificing housewife, asking "Why then should the home-maker still say, 'My grandmother did it this way so it's good enough for me,' instead of being proud that she inherits enough ingenuity and ambition from her grandmother to meet the needs of her times in her own way as successfully as her grandmother did hers?" (1927, 18). Women would *feel better*, she insisted, if they economized their motions, and if they felt better, they could produce a more efficient and stimulating home life for their families. Like earlier feminists and progressives, she tried to disassociate morality from household drudgery: morality was to

²⁸ Quoted in Edna Yost, "What Makes You Tired? Well It's in Your Mind—Not Your Body" (*New York World*, April 4, 1926, c. 136, f. 0830–50[1], NF, GC).

²⁹ Quoted in Clara Woolworth, "Reducing the World's Weariness and Waste" (*The Woman's Viewpoint*, 1926, 23–24 [c. 8, f. 0030–39, NF, GC]).

be obtained through a healthy home life, and this was possible only after the home was made efficient.

Gilbreth's understanding of individual psychological differences and environmental influences and her emphasis on "personal expression," "satisfaction," and "individuality" allowed her to create positive arguments for efficiency that built up women's hopes and responsibilities rather than playing into their supposedly "instinctual" fears and anxieties. Everyone strives for satisfaction in work, she believed, but the aspects of work that yield satisfaction vary from person to person. It stands to reason, then, that some women are quite satisfied to do housework while others become bored with it. This fact demonstrated that the problem resided not within housework itself, but within those women whose ignorance and poor attitude kept them from taking interest in their household tasks (Gilbreth 1927, 20–22). The title of Gilbreth's October 1926 radio address made this point clearly: "What Makes You Tired? Well It's in Your Mind, Not Your Body."³⁰ Becoming "motion minded" while engaged in repetitive tasks would require women to study the arrangement of work spaces and their own motions, select appropriate tools for simplifying their work, and focus their attention on devising even more efficient ways to execute the routine. Mapping this intellectual challenge onto housework was a simple way of addressing women's boredom without calling for more radical changes in the way housework was distributed and accomplished.

Not only could motion mindedness reduce fatigue and create interest in housework, it could give housewives time for other pursuits, a bonus that management consultants could seldom offer to factory workers. Time saved by working efficiently could be invested in hobbies, charity work, or a part-time job—all activities that promoted women's psychological satisfaction, added variety to their days, and made them happier (Gilbreth 1927, xi). Perhaps more important, a rested and enthusiastic housewife would have the time and energy to be a better parent. It was children who suffered most when their mother became mentally unstable due to excessive fatigue and shortage of leisure, a condition, she argued, that could be corrected by improving women's efficiency (Gilbreth 1927, 151; Yost 1949). Citing the new research in developmental psychology, she described childhood as the formative period of human development and reinforced women's responsibility for their children's social and psychological growth (see Ehrenreich and English 1978; Litt 1996). Throughout her

³⁰ "What Makes You Tired? Well It's in Your Mind, Not Your Body," transcript of radio address on WEAf, October 9, 1926, c. 9, f. 0030–40, NE, GC.

career, Gilbreth worked to establish the mother's role in nurturing the individuality of children, continually connecting this role to efficiency by arguing that only a rested mother can give her best to her children (Gilbreth 1928; Sprackling 1935).

The best mothers not only save time for their children, they learn enough about psychology to recognize and foster their children's individuality, wrote Gilbreth. Because children too must rest, work, and express their individuality in the home, children's special needs and interests must be taken into account before they are assigned particular chores. When correctly delegated, housework could be a wonderful experience for children: "Johnny needs to work. We can see that the work is of such a nature that it will develop him both mentally and physically as well as test his aptitudes and increase his abilities; also that he does the work with the right motions" (Gilbreth 1927, 150–51). To measure the child's attributes, Gilbreth recommended surveying the interests of family members and administering aptitude tests, making a game of it, if necessary to hold the child's attention (43–44). The least desirable jobs could be sent out to affordable private service companies or avoided altogether through the purchase of ready-made products. Only those tasks that individuals enjoyed doing or that could not be conveniently or affordably exported would remain in the home, where they could become channels for self-expression. Every decision about the division of labor and household consumption thus would become calculable in terms of its ultimate effect on individual psychology and family harmony.

Journalists recognized the popular interest in Gilbreth's own "household system." Each time she gave a speech or issued a press release about homemaking, newspapers and magazines intermingled her advice with another recounting of her personal story, stimulating their sales with a fascinating human interest piece while doing a public service in the name of reducing women's drudgery.³¹ Reporters would shock the public by disclosing that Gilbreth had eleven children (often presenting a picture of the brood as evidence) and then revealing that she made time for her career by using scientific management in her own home. To win the publicity necessary to build her career, Gilbreth thus sacrificed the family privacy she had guarded in earlier years. Her extraordinarily large family and the fact that she was now caring for them all without a husband became the ultimate proof of her legitimacy as an authority on homemaking. As the *Boston Post*

³¹ There are hundreds of newspaper articles about Gilbreth with this theme. Those from 1926, e.g., are found in c. 8, NF, GC.

put it, “in the eleven children which she has reared, Mrs. Gilbreth has eleven excellent reasons why she should know what she is talking about.”³² Because her persona bridged several cultural contradictions—feminine but intelligent, soft-spoken but persuasive, a woman but a scientist—her image helped to dispel fears that efficient homemaking might destroy the virtues of motherhood and undermine the morality of family life. By tying her personal story to her homemaking advice, the mass media helped to transform Gilbreth into an authority on homemaking after 1925.

To solidify her new reputation, Gilbreth organized a scientific management conference in 1927 at Teacher’s College in New York for two hundred local homemakers, home economists, students, and business representatives.³³ Engineers from major factories and department stores were invited to speak about the savings scientific management had brought to their own firms and to estimate how similar rewards in time, money, energy, and happiness could be won in households. Gilbreth was very pleased by the “almost overwhelming” response to this project, even though no salaries or fees were paid to her or to any of the experts participating (1998, 214–15).

Although this conference, like her book, probably overestimated the typical homemaker’s interest and abilities in science (Kneeland 1928, 312; Strasser 1982, 213), it succeeded at getting home economists in New York City to pay attention to scientific management principles (and by extension, to Gilbreth herself). It provided them a welcome introduction to the technical methods of scientific management that they could pursue further by taking courses in industrial engineering. Late 1920s and early 1930s articles in the *Journal of Home Economics* show a growing interest in measuring time and motion, standardizing household equipment, and quantifying the time reductions in household labor (e.g., Kneeland 1928, 1929; Schwartz 1929; Davison 1930).

The real novelty of Gilbreth’s 1927 writings, lectures, and conference, however, was her infusion of psychological thinking into homemaking. A *Journal of Home Economics* review of the conference proceedings noted that “in no way was the emphasis put on the mechanical so-called efficiency methods alone. . . . The personnel work and all the aspects of better relationships among workers is of course the accepted interpretation today rather than the mechanizing of an office or a home” (Howe 1928, 48).

³² “Mrs. F. B. Gilbreth in Radio Address,” *Boston Post*, December 11, 1925, c. 8, f. 0030–38, NF, GC.

³³ “Teachers College Conferences on Homemaking: A Study of the Home Based on Scientific Management in Industry,” conference program, March–April 1927, c. 86, f. 0655–1, NF, GC.

Just as she had in industry, Gilbreth was introducing a new psychology of work and management into the home, and home economics embraced this enriched vision of the homemaker and the new possibilities for personal satisfaction that it implied. Whereas prior to Gilbreth's book and conference, the significance of psychology to home economics had involved identifying the traits of good homemakers (Charters 1926) and improving women's knowledge of child care (see Ehrenreich and English 1978), in 1929, leading home economist Anna Richardson wrote, "the well-ordered home of today, like other efficient enterprises, is run according to accepted principles of good management, even though the objectives for homemaking are human satisfactions and development, rather than increased production or sales" (1929, 21). The discourse on homemaking was making room for a noneconomic calculus of human satisfactions to fill the role that cost accounting had played in industry. With this logic in place, housewives long discounted as unproductive (see Folbre 1991) could be rewarded at least psychologically, if not economically. In 1930, an advertisement for the *Ladies' Home Journal* captured this new spirit of homemaking, describing it as "a bigger job than housekeeping. It is a bigger job than that of any man in any business. More money is spent in homemaking, in the aggregate, than in any other human endeavor. And the returns, in satisfactions, pleasures and progress, are also greater. The future of America is more dependent upon homemaking than upon all our other industries combined."³⁴ Homemakers and home economists alike were shown that modernization would increase job satisfaction without threatening the ideal of a nuclear family in a private home with a full-time homemaker.

Gilbreth's various activities and pressures during the 1920s complicated her gender politics. She sometimes presented traditionalists with exactly the ammunition they needed for keeping women out of the labor force and positions of power. For instance, when she wrote that "there is as much monotony in the office or plant as in the home, and as much pleasure, but there probably is less variety of work and opportunity" (1927, 111), her words suggested that any woman should be willing to pursue homemaking as a full-time occupation.³⁵ Certainly, Gilbreth's "psychological fix" for women's boredom was less disruptive to men's lives than were

³⁴ Advertisement for *Ladies' Home Journal* in the *Saturday Evening Post*, June 21, 1930.

³⁵ This must have been an especially difficult position to defend when feminist Ethel Puffer Howe invited her to speak at the Institute for the Coordination of Women's Interests in 1927 (Hayden 1981, 275). Howe believed that women should not be expected to find all of their satisfaction in the home and that community services should be created to allow women an outside life (268–69).

feminist proposals. At the same time, her advice also let women know that their psychological health was important both as a means to family harmony and as an end in itself. As Phyllis Palmer has noted, Gilbreth's 1927 book condemned women's unselfish, sacrificial mentality and insisted instead that they create time for pursuing their own interests (1989, 33–34).

In the process of building her career as a homemaking advisor, Gilbreth had to identify the boundaries of social tolerance and negotiate her principles and ideals within those constraints. In 1926, she overstepped those boundaries during a talk on "The Reconciliation of Marriage and Profession" delivered to the International Federation of University Women. According to one newspaper's report, Gilbreth claimed that a woman can have a career and a happy home life if she plans it properly, but only on one condition: her husband must be willing that she should have her occupation and must help her to arrange her life so that her work can be included. Apparently Gilbreth underestimated the diversity of perspectives in her audience because the mass media backlash was immense: at least sixty-five newspapers picked up the Associated Press release and mocked her comment by printing articles with titles such as "Fifty-Fifty Husbands," "Man at the Cook Stove," and "Wanted — Kitchen Husbands." As the *Jersey City Journal* put it, "Kitchen duty for husbands, which antifeminists long ago prophesied as a dire outcome of the education of women, is now under serious discussion at the convention" ("Says Men Need 'Kitchen Duty'" 1926).³⁶ By the end of the year, Gilbreth had toned down her argument substantially. She actually retracted it in 1927: "This book makes no appeal for 'kitchen husbands' or 'kitchen sons' or anything that the words imply," and she was careful to qualify her similar statements in years to come. Even so, she never denied what a great help Frank had been in enabling her to have a career (Eaton 1926, 317). Through the years, she demonstrated a tremendous protean capacity to tailor her words for the particular audience at hand that makes it difficult to categorize her gender politics definitively or consistently.

Commercializing household efficiency: Gilbreth's model kitchens

Teaching women efficiency lessons may have been personally satisfying work, but building a career on household scientific management required that Gilbreth move beyond housewives to attract the interest of private businesses. Because companies were interested in women primarily as consumers, winning their support meant that Gilbreth had to integrate her

³⁶ The 1926 newspaper articles referenced in this paragraph are from c. 8, f. 0030–39, NF, GC.

psychological scientific management approach with techniques for managing women's consumer behavior. It was not until 1929 and 1930, when she allowed her efficiency message and her personal story to become instruments for the larger commercial objectives of utility companies and newspaper publishers, that her family's economic situation finally stabilized. Since the early 1920s, utility companies had been vigorously promoting new appliances such as refrigerators that would increase consumer demand as well as balance the load on their central stations. Some developed home service departments and constructed demonstration kitchens at the offices where women paid their monthly utility bills. Women were reportedly spending more than half of their homemaking time in the kitchen (Kneeland 1929, 477), and the latest emphasis in kitchen design was on beauty, functionality, and a smaller size suitable for a single worker rather than a team of servants (MacFarlane 1991). By showing off new appliances and demonstrating, for example, how new temperature controls on ovens were changing standard methods of baking, utility firms hoped both to stimulate demand and to address women's uncertainty about their changing kitchens. Firms often hired female consultants to add a feminine touch to these models.³⁷

In the autumn of 1927, Gilbreth spoke before the American Gas Association in Chicago, which promptly distributed a copy of her speech to its nationwide membership. At least one member, Mary Dillon, president of the Brooklyn Borough Gas Company, recognized Gilbreth's untapped potential: If a gas company hired her to design a model efficiency kitchen, her reputation as a supremely capable yet feminine and motherly industrial engineer could be mapped onto the public image of the company and onto the gas-powered appliances on display. A popular connection could be forged between gas, modernity, motion savings, and what today we would call "superwomanhood." Dillon hired Gilbreth to design the "Kitchen Practical," which was first shown at the Woman's Exposition of September 1929 and was then moved to the company's sales offices on Coney Island (fig. 1). This kitchen became the prototype for several other efficiency kitchens that Gilbreth designed in the following years.³⁸

³⁷ On utility companies and their promotional tactics, see Nye 1990; on model homes, see Wright 1980 and Hutchison 1990; on the role of home economists, see Goldstein 1994, 351–64.

³⁸ These included four for the New York Herald Tribune Institute (1930), one for the Naragansett Electric Light Company (1930), and one for America's Little House (1934), which was sponsored by Better Homes in America. In addition, a replica of the Kitchen Practical was created at the Santa Barbara Housing Conference (1930) and another at the Housing Conference (1930) in Berlin, Germany (Lillian Gilbreth, untitled MS, list of Gilbreth's model kitchens, poems, and charts, c. 88, f. 0655–8, NE, GC).



If the home-maker could be made to feel that homemaking is a science, then she could see what principles of efficiency might be applied. If she could be

KITCHEN PRACTICAL

made to feel that it is an art, then she would want to spend more time at it. . .

●
THE STORY OF
AN EXPERIMENT

Figure 1 Cover of the publicity pamphlet for the Kitchen Practical, 1929. Reprinted with the permission of Purdue University Libraries.

In 1930 she began work on a larger model kitchen project for the New York Herald Tribune Institute, a homemaking research branch of the *Herald Tribune* newspaper. Like women's magazines, this organization earned much of its profit by selling advertising space to companies catering to homemakers. Its mission was to locate, test, develop, and interpret new suggestions and tools for every phase of homemaking, and it reached the public not only through the newspaper's *Sunday Magazine* but also by hosting large women's conferences and inviting women's clubs to use its lecture hall and other facilities (*New York Herald Tribune* 1930). The institute's director, Marie Meloney, hired Gilbreth to design one ten-by-twelve-foot kitchen, a kitchen laboratory, and two smaller kitchens, including a tiny kitchenette for a dual-career couple (which was actually the blueprint for the kitchen that Lillian later gave her daughter Ernestine as a wedding present).³⁹ These opened in June of 1930 to heavy publicity.

For each of these collaborative projects Gilbreth arranged a collection of the latest appliances in the most efficient manner within an established space. Since the motions required for cooking and cleaning were essentially the same whether the large appliances ran on gas or electricity, the layouts of the Kitchen Practical and the largest Institute kitchen were very similar. Each sponsoring company published a pamphlet explaining the appliances in use and how Gilbreth's motion studies had scientifically determined the layouts of the kitchens. The gas company's expressed objectives were to illustrate to the homemaker "how she might do routine work in a minimum amount of time and with a minimum amount of effort" and "how the kitchen might be made so attractive that she would want to spend more time in it doing some of the really enjoyable tasks a good kitchen makes possible" (Dillon and Gilbreth 1929, 1). Gilbreth took on the first of these goals while an interior decorating firm handled the second, an arrangement that blended efficiency and femininity. Furthermore, at each model kitchen, visitors viewed a female staff member—a "model homemaker"—efficiently preparing test recipes with a minimal expenditure of motion and time.⁴⁰

Gilbreth's image was explicitly attached to the femininity promoted in

³⁹ "Herald Tribune's Lady" 1934; author's conversation with Ernestine Gilbreth Carey, May 24, 1994. Marie Mattingly Meloney also led the Better Homes in America trade organization, which had been setting up model homes all over the country since 1921 (Hutchison 1990).

⁴⁰ The *New York Herald Tribune Sunday Magazine* printed several articles featuring pictures and detailed descriptions of these model kitchens. See, e.g., Anne Hard, "A Romance of Efficiency," June 8, 1930, c. 87, f. 0655-3, NF, GC; and Esther E. Kimmel, "Efficiency in Small Quarters," February 8, 1931, c. 137, f. 0830-50(5), NF, GC.



Figure 2 The Gilbreth family plus in-laws in 1930. This photo was also printed in publicity for the New York Herald Tribune Institute model kitchens in 1930. Reprinted with the permission of Purdue University Libraries.

the models. At the Kitchen Practical, free copies of her coffee cake recipe were given away, and popular press articles, including those in the *Herald Tribune Sunday Magazine*, showed pictures of Gilbreth with and without her family (fig. 2). Cameramen even came out to the Gilbreth house during this period to make a publicity newsreel, triggering a crisis that forced Lilian to have her own kitchen remodeled in a hurry (Gilbreth and Carey 1950, 101–3). To add an extra personal touch, Gilbreth wrote several short poems to hang on the walls of various kitchens. One, titled “My All-Electric Kitchen,” linked the “shortest motions” to “skill and satisfaction” and another, called simply “My Kitchen,” alluded to the dual roles of the homemaker as scientist and artist, whose busy heart, brain, and hand “can make a dream come true.”⁴¹ By quoting Gilbreth, describing her family, showing her family picture, distributing her recipe, displaying her poetry, and frequently mentioning her name, the sponsoring companies tied themselves to her reputation as both domestic whiz and engineer. Her resolution of the conflicts between motherhood and science reinforced wom-

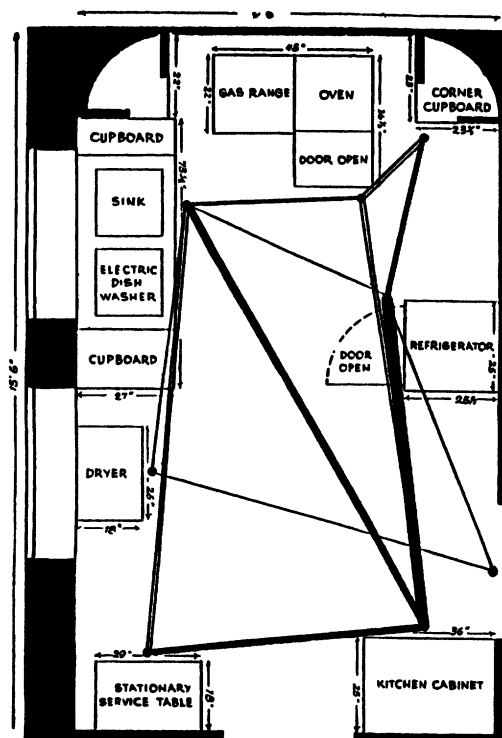
⁴¹ “My All-Electric Kitchen” appeared at her model kitchen for the Naragansett Light Company, Providence, Rhode Island (TS, c. 88, f. 0655–7, NF, GC). “My Kitchen” is reprinted in Gilbreth 1970, 212.

en's hope that modernizing their homes would make them into more capable mothers.

Designing model kitchens gave Gilbreth an opportunity to use her engineering skills in two ways. She adapted the height of work surfaces to fit the height of the model homemaker and she created a "circular work place" by optimally arranging appliances and work surfaces for a variety of cooking and cleaning tasks (Gilbreth 1930). Women visitors could "install" correct heights in their own kitchens by having their height and arm reach measured on site and then having their range, sink, and counter cabinets either raised by putting them up on blocks or lowered by sawing off the wooden cabinet legs. The circular work place ideal was much more difficult to bring home and use. Since the pamphlets and articles made no effort to teach motion study, women were left with only one real option: to purchase the appliances displayed and mimic the model's floorplan as best they could. The Kitchen Practical pamphlet suggested that each homemaker "adapt what she sees to her own means and make it fit the characteristics of herself and her family—physical, mental and emotional" (Dillon and Gilbreth 1929, 4).

If a woman succeeded in copying these features, her new kitchen would "cut almost in half the number of motions required in preparing any given dish, and reduce to less than one-sixth the amount of walking required" (*New York Herald Tribune* 1930, 8). These astounding results were presented in "before and after" work diagrams displayed on the wall of the institute's kitchen and reprinted in the pamphlet (fig. 3). By comparing the varying thickness of the lines running between work centers, viewers could judge approximately how much energy they could save by making their kitchens efficient too. While they thus acquired a favorable image of the sponsoring company, visitors were supposed to remember the appliances that they saw and purchase some of them. To aid their memories the institute devoted one-fifth of its pamphlet to a list of kitchen equipment with prices for both premium quality items and cheaper substitutes, giving special attention to two of its own inventions, the *Herald Tribune* "Door Closet" and "Planning Desk." The Brooklyn Borough Gas Company used a similar approach to promote gas appliances in a year when gas and electric refrigerators were in fierce competition (Cowan 1983, 139–43). Both the institute and the gas company assumed an air of impartiality toward particular brand names in their articles and pamphlets, but they left no doubt that new appliances of some kind were essential for efficiency.

In contrast to Gilbreth's earlier psychologization of homemaking, these projects took household scientific management in a commercial direction. The whole effort to standardize kitchens was at odds with her usual

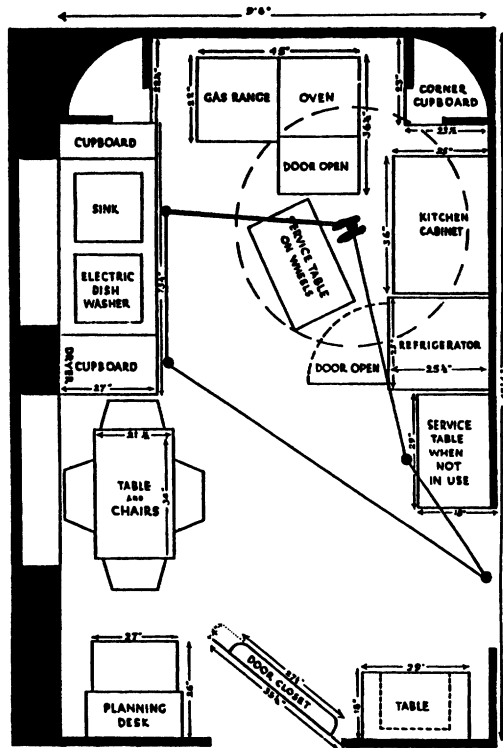


Plan No. I—The average sized kitchen with the usual equipment. The overlapping lines show how the haphazard arrangement necessitated the retracing of steps in the preparation of a test recipe.

Figure 3 “Before” (above) and “after” (facing page) diagrams showing the steps saved by Gilbreth’s arrangement of appliances in the *New York Herald Tribune* Institute’s own model kitchen, 1930. Reprinted with the permission of Purdue University Libraries.

preference for examining the particularities of each individual worker, the work environment and tools, and the necessary motions before making recommendations. Except for the variable height of work surfaces, the models abandoned the notion of a unique homemaker whose own “one best way” could be determined only by her own research at home. Instead, the models implied that there was one best way for everyone to organize their kitchens. Mere lip service was paid to the goal of endowing women with new engineering skills, and the idea of using psychology to delegate household tasks to the children was completely ignored.

How could Gilbreth have supported this? Financial incentives clearly helped to broaden her tolerance of these commercial projects. Exact dollar figures are not available, but there is evidence that these were Gilbreth’s best-paying projects since Frank’s death (Yost 1949, 338) and that the in-



Plan No. II—The same kitchen, with the same working equipment, in its efficient circular work space arrangement. By moving the service table in front of the electric dishwasher another circular work space is created. (Note the minimum of retracing steps required by this arrangement in the preparation of the test recipe).

come she earned from model kitchens allowed her to give up teaching her motion study course in 1930 (Gilbreth 1998, 222). Designing model kitchens was an intelligent career move because it allowed her to pocket some of the money from the emerging consumer culture without forcing her either to sacrifice rigor or to explicitly embrace consumerism in her actual work. Perhaps it was through her friendship with businesswomen such as Marie Meloney—who reportedly did not consider something commercialist unless it profited from the sale of poor quality merchandise (Hutchinson 1990, 147)—that Gilbreth learned to be more flexible in her attitude toward commercial projects.

Like most of Gilbreth's writings, her model kitchens preserved the gender based division of household labor. One notable instance of possible subversion, however, is worth mentioning. Without overtly calling on husbands to share in housework, Gilbreth and Dillon printed one photograph of a man in an apron working alongside his wife and daughter in the

Kitchen Practical. They seemed to be hinting that a modern, efficient kitchen might inspire the whole family to participate in housework, a prospect that many women must have found appealing on some level. It seems that they simply could not resist the opportunity to idealize family cooperation in housework. Perhaps it was also Gilbreth's way of reconciling her own experience of family cooperation with the ideal of the solitary do-it-all mother that the models seemed to uphold.

The model kitchens brought a more commercial and less psychological version of Gilbreth's household scientific management to thousands of urban homemakers directly and to thousands more indirectly, via the publicity about them. Without a doubt, many more women visited, read about, or heard about these model kitchens than read Gilbreth's 1927 book or attended her conference. Thanks to this highly publicized work, along with the continued support of women like Mary Dillon and Marie Meloney, Gilbreth earned an international reputation in the field of kitchen design that enabled much of her work in the remaining forty years of her career.⁴² In 1935, five years after the success of her model kitchens, Gilbreth was offered an academic post divided between Purdue University's School of Home Economics, its School of Management, and its Office of the Dean of Women. Commuting to Purdue by train and staying in a student residence hall for weeks at a time, Gilbreth spent six years incorporating motion study and psychology into the management curriculum and making "Work Simplification" a new subfield within home economics.⁴³ College departments of home economics applied her expertise to their practice kitchens, and her work exerted "considerable influence on home management courses throughout the U.S." (Cowan 1980, 272). In some of her most personally rewarding work, she designed special model kitchens for disabled homemakers in the 1950s. In 1954 she and two colleagues published a book systematizing the accumulated knowledge about motion-mindedness, work methods, storage practices, tools, layout, and working conditions in the home (Gilbreth, Thomas, and Clymer 1954). The psychological side of her work was carried forward by various new disciplinary

⁴² According to Hutchison 1990, Meloney unsuccessfully attempted to appoint Gilbreth to a high post within Better Homes in America in 1933 (120–22). She did hire Gilbreth to design the kitchen, a "clothery" (a new combination of laundry and sewing room), and a nursery for the highly publicized "America's Little House" in 1934 (Gilbreth 1998, 232). Mary Dillon corresponded with Gilbreth for many years, helping to extend her network within the New York business community (Dillon to Gilbreth, May 23, 1931, c. 137, f. 0830–51, NE, GC).

⁴³ Author's conversation of December 5, 1991, with Mary L. Foster, a Purdue University Department of Home Economics graduate who knew Gilbreth in the late 1930s and early 1940s and who went on to teach in that department.

specialties including developmental psychology, consumer education, and family ecology.

As home economist Hildegard Kneeland predicted in 1928, housework eventually would become more efficient largely through improvements in housing and equipment, with "the homemaker playing the more passive role of consumer" (314). While home economics took over the task of popularizing the concern for kitchen efficiency, mail order houses of the 1930s marketed streamlined kitchens with interconnected appliances and continuous work surfaces, and by 1945 manufacturers had agreed to build base cabinets 36 inches high to fit a woman of average height (Giedion 1948, 519–27, 613–16; Carrell 1979), sacrificing height adjustability for standardization, a move that must have disappointed Gilbreth. Even so, the *Maytag Bulletin* credited her with inspiring these trends in the material components of the kitchen: "Many of today's labor-saving devices found in the home have been credited directly to Dr. Gilbreth's approach to 'engineering in the home.'"⁴⁴ Her "circular work place" was transformed into a "work triangle" (linking centers for storage, cleaning/preparation, and cooking) that remains important in the design of kitchens today.⁴⁵ In the late 1990s, advertisements for new appliances still appeal to the interest in saving both time and energy and make the kitchen seem so wonderfully modern that even husbands and children can manage the "user-friendly" microwave and dishwasher. Nevertheless, as feminist histories of housework have shown, housework remains primarily the responsibility of women, and much of the time saved by new consumer products has been absorbed by the increasing responsibilities of middle-class women in both the household and the workplace (Cowan 1983; Bose, Bereano, and Malloy 1984; Hochschild 1989). An unfortunate part of Gilbreth's legacy is that many women today continue to feel the sole responsibility for maximizing efficiency and psychological health within their homes.

The personal is scientific

The individual which power has constituted is at the same time its vehicle.

— Foucault 1980, 89

Gilbreth's quest to improve the work habits of millions of American women was circumscribed from the start by a framework of patriarchal and capitalist power. While she was domesticating efficiency principles to

⁴⁴ In 1959, Gilbreth gave the main address at the fourth annual Maytag Work Simplification Recognition Dinner (*Maytag Bulletin*, March 5, 1959, b. 24, RF, GC).

⁴⁵ Today's home economics literature still contains the types of time and motion studies pioneered by Gilbreth (Bose, Bereano, and Malloy 1984, 77).

make them fit the home, the larger culture was domesticating her by re-aligning her skills, interests, and politics to fit patriarchal conceptions of womanhood and to promote the economic interests of businesses. Because housewives worked without pay, no organization found it profitable to pay Gilbreth merely to simplify housework. Only when she made her skills and public image relevant to companies interested in managing women as *consumers* did she finally stabilize her financial situation. This is how her name eventually came to be associated with the standardized kitchen, a commercial innovation that ran counter to her psychological principles and professional goals. She also ended up tacitly reinforcing the sexist doctrine of separate spheres, the same ideological system that had closed down opportunities for her in industrial engineering after her husband's death. Oftentimes her advice made her own life choices seem unwise or unethical: for example, her career was not the kind of occasional hobby or part-time job that she recommended to other women. Perhaps the greatest irony of all, however, is that her work became useful for bolstering the problematic claim that women can do all of the housework alone and still have time for family and other pursuits. In moments when she attempted to crush this sexist belief, she was made into a buffoon by the mass media. Whether one believes that she just did not try hard enough to resist women's oppression or that society left her with no option but to affirm oppressive ideologies, it is clear that Gilbreth became a vehicle for some of the very types of patriarchal power that caused her such personal difficulty.

Does this mean that she should be characterized as a "sell out"? This close look at her experiences during six difficult years helps to make sense of the complex implications of her work both for women's independence from men and business and for their control over their own labor. Gilbreth's plan in 1927 was to empower housewives with the skills they would need to improve their own work and make time for their children, a hobby, or a job. The political content of her message did not become commercialist until she shifted her target audience from housewives and home economists to private firms, letting her work become a spectacle for generating excitement about new commercial products and services. Without overtly advocating women's subservience, her model kitchens nonetheless reinforced women's dependence on the earning power of their husbands and on the particular offerings of corporate America.

To characterize Gilbreth as an "antifeminist" or an "apologist for capitalism" would be shortsighted, given what we now know about the pressures she faced. Her allegiances and intentions were reconstructed over the course of her career, and Gilbreth necessarily became adept at molding her message to fit the vernacular of many different social groups (Graham 1994). This malleability was limited by certain promises she made to her-

self: that she would keep her family together and put each of the children through college, that she would continue Frank's quest to simplify work in a variety of occupations, and that she would not sacrifice her own scientific integrity to become a mere endorser of products and services. Certain other concerns proved to be more flexible: the privacy of her family, her stand on the importance of family cooperation in housework, and her initial reluctance to participate in any kind of promotional project whatsoever. These personal boundaries bent under the weight of capitalist and patriarchal pressures from the larger culture, such as sex discrimination in industrial engineering and in companies catering to women, traditional images of teaching as a women's field, pressures on mothers to be at home with their children, the patriarchal tradition of treating housework as an unpaid labor of love, and the notion of women as passive consumers rather than active producers of knowledge. Gilbreth herself emerges as the human site of a dynamic interplay between, on the one hand, personal goals, principles, ethics, and interests and, on the other, employment opportunities, discursive systems, ideological traditions, and economic structures.

One might speculate that this same kind of reciprocal articulation of self and social context occurred in the careers of many gender mediators who were unprotected by secure institutional supports. Gilbreth's story illustrates a more general dynamic of compromise and principled resistance that has come into play whenever a woman's livelihood has depended on mediating between private companies and women. Their personal lives have shaped the form and content of their scientific and technical work in complex ways that many historians and sociologists of science have yet to appreciate.⁴⁶ Instead of criticizing these women for being "part of the problem," we ought to study each woman's life carefully and understand her legacy as a compromise struck within a patriarchal society.

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⁴⁶ Sociologists and historians of science and technology who have examined the interaction between the social and the technical seldom count personal circumstances as a key component of the social (see, e.g., Barnes 1977; Latour 1987), perhaps because their case studies tend to focus on white men of privilege. Gilbreth's story suggests that, especially in studies of individuals marginalized by race, class, or sex, this inattention to the personal cannot be justified.

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