Household science: a new occupation for women?

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Abstract

An educational and social movement to raise the status of housework by emphasising its scientific nature developed in Europe, North America and other countries in the period from around 1880. This has mostly escaped the attention of scholars, who have failed to see how cleaning up homes and improving domestic nutrition could have an impact on public health. This article focuses chiefly on another aspect of the household science movement: its consequences for women's work both inside and outside homes. Notions of scientific efficiency and improved house design, together with attention to the poor working conditions of housewives had a lasting effect on the way housework was done. New housework technologies created professional opportunities for women on the fringes of the scientific/technical world.

Keywords

Women's work; housework; science; reform; feminism

Biography

Ann Oakley has worked in social science research and teaching for almost 60 years, mainly at the Universities of Oxford and London. She founded both the Social Science Research Unit and the Evidence for Policy and Practice (EPPI) Centre, now part of UCL. She has authored or

edited more than 40 books and has a long list of other publications specialising in the areas of gender, reproduction, health care, women's work, and methodology.

Introduction

Household labour is the most dominant form of work globally. In all countries and cultures, it is predominantly women's work. However, it has received very partial attention from scholars, who have focussed mostly on patterns and trends in the amount of workers' time it occupies; the gender division of labour; and the impact of technological innovation and change. A spectacularly ignored area is housework as a form of *scientific* activity: the extent to which the cleanliness of people and homes and the nutrition and body care provided in homes depends on knowledge derived from core scientific disciplines such as bacteriology, chemistry, physics, engineering and food science. Women as houseworkers have not generally been seen or studied as practitioners of science, and neither have those who have taught, researched or written about household science.

This article draws on material collected for my book, *The Science of Housework: The Home and Public Health, 1880-1940,* which looks at the forgotten history of an international movement led by women to emphasise the science in housework. The household science movement began in the UK and the US and spread to many countries, including Africa, India, Japan and New Zealand. The movement brought together various networks of reforming women, and it formed an important plank in campaigns for women's emancipation by arguing that efficient domesticity could only be supplied by highly educated women. A primary goal of the movement was to improve personal and public health by raising the subject of household science to an equal status with other sciences in educational institutions.

There were various ways in which the household science movement affected women's work both inside and outside homes. First, there was the role women played in advancing the cause of household science in schools, colleges and universities. They taught it, researched it, wrote books about it and engaged in creative collaborations with other scientists. Second, the movement opened new doors for women's professional work in science, technology and academia, sometimes in unexpected and not wholly positive ways. Third, and in alliance with the emerging industry of household technology, it led to a new version of women as 'Mrs Consumer'.

Why so little work on the household science movement?

Why has the record of women's work in household science largely disappeared from history? Feminist scholars and activists have tended to view any education for girls and women in household science as simply a conspiracy to keep women in the home. In her *Wasting Girls' Time: The History and Politics of Home Economics,* the educationalist Dena Attar, for example, argues that home economics (one of the commonly used labels for the subject) has been educationally harmful as it is essentially a form of sexist indoctrination. A similar case is put by Barbara Ehrenreich and Deirdre English in their pithily argued *For Her Own Good: 150 years of the Experts' Advice to Women*. However, *For Her Own Good* does admit that there was something refreshing about the unsentimentality of the household science movement. Campaigners took a pragmatic view of homes as places that could, and should, make people healthier. They insisted that, far from being a retreat from the dangers of the industrial world, the home itself is an industrial workplace with all the dangers and opportunities that implies.

Another blow to the scholarly analysis of housework as science was anthropologist Mary Douglas's highly influential book *Purity and Danger,* first published in 1966. In it Douglas argued that ideas about dirt and cleanliness are primarily ways of creating social order. Dirt is

disorder. It exists in the eye of the beholder. Rather than being about the prevention of disease and the promotion of wellbeing, housework is basically made up of classificatory rituals that organise the social world. The tradition of scholarly work that Douglas's perspective continues to inspire is very far from the view espoused by the household science campaigners of the late 19th-and early 20th-century. When they used the term 'science' they were referring to science as a matter of *fact*: a rigorous, systematic endeavour that builds and organises knowledge in the form of testable explanations and predictions about both natural and social worlds. In her study of microbes, *The Gospel of Germs,* the historian Nancy Tomes invites us to detach from the *Purity and Danger* tradition and imagine another anthropologist looking back at the AIDS epidemic in a 100 years and labelling preventive measures such as condoms and bleach-disinfected needles as 'gestures of separation and classification'.[1]

The dismissal of home economics, household science, or whatever you choose to call it (and it was called different things in different places), as a device for oppressing women or a collection of classificatory rituals means that whole segments of associated histories have fallen by the academic wayside. In just one example, historian Sally Sheard examined the development of public baths and wash-houses in the UK between 1847 and 1915. She found a substantial literature on large-scale sanitary infrastructure reforms, but very little on the smaller-scale but critical matter of public baths and wash-houses. These played a key role in reducing many transmissible diseases including typhoid, which is spread by lice who flourish on dirty bodies, clothes and bedding.

Placid beginnings

The international household science movement is generally considered to have got off the ground in 1899 when eleven people met at the Lake Placid Country Club in the wilderness of the Adirondack Mountains in upstate New York for a conference on something they initially

called ‘home science or household economics’. The discussions that took place there and at the succeeding nine conferences effectively solidified a consensus among household science campaigners that the only way to make people take it seriously was to get the subject into the universities. Theirs was an ambitious programme of education, research and policy-making. It drew on the long history in many countries of educating schoolgirls (but hardly ever schoolboys) about housework. Some of the household science campaigners were feminists who saw that science and technology could breed greater efficiency in the home and give more freedom for women to lead lives outside it. Others regarded homemaking as women’s essential mission. But even in this case there was a powerful argument for improving its scientific basis because (it was claimed) once women knew how to do it properly they would enjoy it more.

Typical of the early literature on household science was a book called *Women, Plumbers, and Doctors; or, Household Sanitation* published by the American writer Harriette M. Plunkett in 1885. The text was full of detail about the structure and management of domestic plumbing systems, frightening diagrams and complicated recipes for success. Plunkett’s argument was that women needed fully to understand the mysteries of domestic plumbing, and that this would lead to less illness and premature death and much less need for doctors. Her book appeared at a critical historical moment when the old miasma theory of disease was giving way to new knowledge about germs. The science of bacteriology began to emerge in the 1870s with startling evidence that microscopic living particles, rather than noxious air, were the causes of illness. Thus a new breed of scientifically-minded housewives was necessary. Women gained a new occupation, that of microbe-hunter.

How to hunt microbes

Microbes had a powerful rhetorical image: they were real but invisibly hidden in dust and dirt. As products of real scientists working in real laboratories, they inspired parallel images of

housewives as scientists working in the laboratory of the home. Indeed, the famous British domestic writer Mrs Beeton, back in 1861, had called the kitchen 'the great laboratory of the household' in her *The Book of Household Management.* At Simmons College for women in Boston, Sophronia Maria Elliott's *Household Bacteriology*, published in 1905, firmly instructed women to become laboratory technicians and apply the scientist's methods to an understanding of household dirt. These are just two examples of a mammoth literature written mostly by women household science educators. Many texts invited women to culture specimens of dust in Petri dishes (so-called 'dust gardens') just like real scientists, because only then would you literally perceive how dangerous dirt really was.

The discovery of microbes meant a greater need for a basic scientific knowledge in the running of homes. Since at the start of the 20th century the mainstream scientific/technical world was effectively closed to most women, here, in the name of household science, was a back door through which they might gain a small measure of gender equality. The history of King's College of Household Science (KCHSS) in London illustrates this journey particularly well. KCHSS began as an informal series of 'lectures for ladies' in West London in the early 1870s as a response to the demand among middle-class women for access to higher education. (The writer Virginia Woolf and her sister the artist Vanessa Bell were among those who benefitted from this enterprise.) Lectures for ladies matured into King's College for Women (KCW) before becoming KCHSS in 1928. Programmes of study in household science had begun in the early 1900s. The core group of campaigners who pushed this initiative forward included two pioneering sanitary educators, Margaret McKillop and Alice Ravenhill; the educationalist Lilian Faithfull; an economist called Mabel Atkinson (who incisively took Adam Smith to task for the misogynistic neglect of housework in his famous *Wealth of Nations);* and a local doctor who was impressed by maternal ignorance as a factor in infant mortality. The household science movement wasn't without its patronizing classist and sexist elements.

Most of the teachers and all the students of the KCW/KCHSS household science courses were women. As an indication of how scientific this endeavour was, Alice Ravenhill's lectures on hygiene went from 'The physical nature of man' through 'The relation of nutrition to health' and 'The preparation, preservation and protection of food', and lectures on the environment and health, physical exercise and school hygiene, to 'some public health problems' including infant mortality, housing, and the growth of public health legislation.[2] As the courses developed they became more and more complex. In 1909 the applied chemistry component, for instance, covered the constituents of the atmosphere; water analysis; foods, adulterants and preservatives; and the chemistry of cooking and of laundry work and other cleansing processes. The KCW enthusiasts were aiming at a full three-year university degree and a one-year postgraduate diploma. Publicity promoted these courses as relevant to municipal welfare workers such as Poor Law Guardians, District Councillors, or County Councillors, as well as to students intending to be factory inspectors or managers of institutions, and of course to all those who were interested in teaching the subject in schools and colleges.

The arrival of household science on the university curriculum - the three-year household science degree at KCW was finally approved in 1920 - was met with a mixed reception. Media headlines poked fun at it: 'The dignity of housework: Educated charwomen wanted'; 'Management of the house: the chemistry of the wash-tub'; 'Doctors of Housewifery'; and 'Model Wives'.[3] But the King's enterprise survived this derision to become, as a result of energetic and lucrative fund-raising, a thriving institution with its own architect-designed set of buildings and specialized scientific laboratories in Campden Hill, Kensington. It was a remarkable repository of knowledge and expertise. In 1953 KCHSS was renamed Queen Elizabeth College. By this time it had acquired an international reputation as a centre of excellence in nutritional science. In this it built on the work of KCHSS pioneers such as Margaret McKillop, who taught chemistry at KCW from

1898 to 1914. During the First World War, McKillop worked for the Ministry of Food, and she wrote a book on food values for which she was awarded an MBE in 1919. Her book was one of the first attempts to translate the findings of nutrition research into usable information for teachers, demonstrators, caterers, social workers and houseworkers who, as McKillop argued, were becoming increasingly aware that scientific methods and knowledge were needed in homes just as much as outside them. Other teachers and researchers based at King's achieved similar, forgotten distinctions, for instance in such fields as vitamins, the nutritional value of human milk, and the cause of the bone disease rickets.

The international scene

In the late 19th- and early 20th-century household science was making its name everywhere. Its form and rate of progress were naturally shaped by local cultural contexts. In the US, its trajectory had been heavily influenced by a piece of legislation passed in 1862 called The Morrill Land Grant Act. This offered land to state universities that would provide training for rural populations in practical gender-divided fields – agricultural and mechanical skills for men, home economics for women. By that date, the case for home economics was obvious to many, including household science's most famous advocate Ellen Richards, the first American woman to get a chemistry degree, the first woman student and member of staff at the Massachusetts Institute of Technology (MIT), the first women member of the American Institute of Mining and Mineralogical Engineers, and the first woman (and the first person) to run a consumer products-testing laboratory. Richards once observed that millions of dollars were spent in agricultural colleges studying the food of pigs, cows and horses, but none, until the arrival of home economics, was spent on studying the food of men (and women).

By 1892, 14 land-grant universities/colleges in the US were running degree-worthy courses called 'sanitary science', 'household administration', 'domestic science' or 'home economics'.

These courses provided hundreds of jobs for women chemists, physicists, engineers, economists and so forth who found it hard to get jobs in male-run scientific departments. Eight years later, there were 30 college departments of domestic science. Although the subsidy provided to household science through the land-grant system helped to publicise the general case for it to be taken seriously in academic circles, it was the new private university in Chicago funded by the oil baron John D. Rockefeller that proved to be one of the most hospitable academic locations for science-based housework courses.

The sanitary scientist Marion Talbot, who trained with Ellen Richards at MIT, was recruited from her job teaching domestic science at Wellesley College for women to do the same at the new university of Chicago. Although missing from most histories of the Chicago sociology department (which is widely regarded as *the* origin of academic sociology), Talbot was one of the four people who staffed the sociology department when the university opened in October, 1892. Highly ambitious both for herself and for her subject, she asked the President of the University for a professorship to head a Department of Household Technology. She wanted a full complement of instructors, laboratory facilities, equipment, a practice house (for teaching practical household skills), a fellowship and scholarships, and possibly even a journal. What Talbot got was something rather less, but still worth having: she became Dean of Undergraduate Women, Assistant Professor in Sanitary Science and a few years later head of a Department of Household Administration. The courses it offered in physics, chemistry, physiology, bacteriology, political economy, and the study of society were intended to train both men and women for the rational and scientific administration of the home, including preparing them to teach the subject.

Similar goals drove education and supplied jobs for women in household science in countries as diverse as India, Japan and New Zealand. But almost everywhere there was resistance from

male academics, who saw women household scientists as belonging in an ‘academic kitchen’ (if not actually a real campus kitchen where they could use their talents in the cost-saving measure of cooking for staff and students).

Selling Mrs Consumer

Those who taught household science and many of those who published books about it found it essential to tackle one main fallacy about housework: that it’s an essentially *unproductive* activity. Housewives don’t produce anything: their main function is to *consume* goods and services. This dogma, perpetrated for many years by male economists, hides the uncomfortable reality that women’s unpaid labour in the home is about producing and servicing workers (men and children). It wasn’t a conspiracy, but it was, from the viewpoint of capitalist economics, a serendipitous happening: new clerical and industrial jobs for women caused a steady decline in domestic servants, and the producers of domestic technologies – vacuum cleaners, electric irons, refrigerators, electric and gas ovens and so forth – were keen to step into the gap and redefine housewives as consumers.

The American efficiency expert Christine Frederick published her extremely popular contribution to the debate about the nature of household work, *Selling Mrs Consumer,* in 1929. The book explores the need for studies of consumers, analyses data on men and women’s consumption habits, and eulogises on the theme of women as family decision-makers when it comes to household purchases of any kind. Frederick was an untiring tester of the new household appliances that were flooding the market. She worked closely with manufacturers, who paid her for her labours, and she even maintained that the interests of manufacturers and consumers are identical, something which other household scientists vehemently contested. The main rhetorical point in the conversion of ‘Mrs Housewife’ into ‘Mrs Consumer’ was that the struggle to be clean and healthy couldn’t possibly be won without buying. And to buy into a state of

proper modernity, one must live in a state of highly technologized domesticity. Advertisers and industry enthusiasts co-opted the labours of household scientists in laboratories and colleges and universities and turned their verifiable scientific facts into seductive, but often unverifiable, slogans. Their astute sales pitch played on the public anxiety about dirt and germs that had been enlarged, if not actually created, by the household science movement.

Mrs Consumer was given a lot more power than she actually had. How many housewives were really in a position to persuade their husbands to buy a new kitchen? The idealised commercialised image of women as financial decision-makers proved to be long-lived. One sign of this was the screening in Norwegian daytime cinemas during the 1950s, 1960s and early 1970s, of a brand of popular 'housewife films'. These films were made by a consortium of marketing consultants and home economics experts in an unusual hybrid format which mixed advertising, entertainment and education. The aim was to display all the latest household technologies in such a manner that women were persuaded to persuade their husbands to buy them. The entertainment breaks inserted in the films were hosted by a comic male figure whose exaggerated domestic stupidity was designed to create a feeling of confident solidarity among the watching women – although precisely how it would help in the persuasion business that awaited them was less clear.

Christine Frederick's second most famous import from industry to the home was the notion of 'scientific management'. 'Taylorism', developed by the American mechanical engineer Frederick Taylor, aimed to increase productivity in factories by dividing shop-floor work into its component processes and studying the quickest way to get these done. Burdened with the care of a home and young children in the early 1900s, Christine Frederick saw the potential for transferring this approach to housework. Following Taylorist principles, she found she could save a third of the time her housework had previously taken. For example, merely by arranging kitchen tools more

rationally, the time spent in peeling potatoes could be reduced from five to two minutes, and the washing of 50 dishes could be cut from 41 to 23 minutes. ‘Efficiency’ and ‘scientific management’ became important elements in household science programmes, and they spurred many more women to develop careers as domestic efficiency experts.

Making homes

The need to do housework efficiently drew attention to the material constraints that faced many women houseworkers in the early 20th century: confined in ill-designed, unhealthy homes with no running water, inside flush toilets, or piped gas and electricity, it was difficult to do anything efficiently.

The household science movement took on fundamental issues of house design. In France, the journalist and philosophy graduate Paulette Bernège launched a severe attack on the thoughtlessness of male architects in 1928 when she published a book called *Si les femmes faisaient les maisons* (‘If Women Made Houses’). This was written in response to government plans to update France’s housing stock. They claim to have consulted all experts, Bernége protested, but where are the real experts, French housewives? Among the many examples of waste Bernège invites architects to consider is that walking the ‘vampiric’ distance between her own kitchen and dining room over 40 years would take her from Paris to Lake Baikal in Siberia.[4] The last French edition of *Si les femmes faisaient les maisons* (it has never been translated into English) appeared in 1969 and Bernège’s own career as a celebrant of scientific efficiency continued well into the 1950s.

In Germany in the 1920s the labours of a young German architect called Grete Lihotzky gave birth to something of lasting importance: the modern streamlined Western kitchen. Lihotzky was an admirer of Taylorism and Christine Frederick’s writings. Working on an ambitious social

housing project in Frankfurt aimed at working-class families, she designed a small space-saving kitchen, modelled on the restaurant car on trains and using the results of scientific research. For instance, Lihotzky's kitchen was fitted with units painted blue, because researchers had found that flies weren't fond of blue. It was crammed with ingenious devices, such as built-in food containers and a hinged draining board that could be angled to flow down into the sink or alternatively stowed away against the wall. Frankfurt kitchens were efficiently prefabricated and lifted into buildings with a crane, and some 10,000 were installed in housing developments in the late 1920s and early 1930s.

Sources of power

A survey by Elsie Edwards, a member of an organization called the Electrical Association for Women, for a conference on scientific management in 1935 found that in three-quarters of 5,000 working-class British households water for washing was still heated using a copper, a gas boiler, or pans and kettles on the kitchen stove. The period from the early 1920s until after the Second World War witnessed an intense battle for custom between the promoters of gas and electricity (with solid-fuel-promoters intervening from the sidelines) to gain the attention of the overburdened consuming housewife. This was another battle led by women. They formed three profile-raising organisations: the Electrical Association for Women (EAW) in 1924; the Women's Gas Council (WGC) in 1935; and the Women's Advisory Council on Solid Fuel (WACSF) in 1943. Of the three, the highest profile and most success belonged to the EAW. In her *Woman's Work is Never Done* Caroline Davidson plausibly contends that the EAW is 'the only example of women actually changing the conduct of housework through collective action' over a period of three centuries.[5]

Early advertisements for electricity depicted servants who wore black dresses, white pinafores and caps. Since servants themselves were rapidly disappearing from middle-class homes, the

point rapidly became that electricity *itself* could be a servant. One writer on the subject, Maud Lancaster, advised that in this capacity electricity 'is always at hand; *always willing* to do its allotted task and to do it perfectly, *silently*, swiftly and without mess; never wants a day off; never answers back; is never laid up; never asks for a rise; in fact, it is often willing to work for less money; never gives notice and does not mind working overtime; it has no prejudices and is prepared to undertake any duties for which it is adapted; it costs nothing when not actually doing useful work.' [6] This gives us some idea of what middle-class housekeepers expected of their vanishing servants. And the sad truth was that servants at this time were a good deal cheaper than electricity.

The EAW was founded by two engineers, Caroline Haslett and Mabel Matthews. It placed much emphasis on science as guaranteeing women liberation from exhausting and old-fashioned methods of managing homes. The EAW, which survived until 1986, was set up to educate and train women in the uses of electric energy by providing electrical education classes for housewives, advice to government and industry, and training for domestic science teachers and demonstrators of electrical devices. It published a series of 'How it Works' leaflets and from 1931 offered an Electrical Housecraft Course which awarded either a certificate or a diploma. There was also a Home Worker's Certificate for housewives covering electricity generation and transmission; the home installation of meters, fuses, and switches; and how to cook, refrigerate, plan kitchens and all the rest of it so as to make the best use of electricity. The EAW produced a textbook, *The Electrical Handbook for Women,* which was widely used for several decades. It's a daunting mix of highly technical detail (what electricity is, how it's supplied and paid for, how to trace and repair electrical faults) and practical information about specific domestic appliances. Most strikingly, the text of the *Handbook* treats women as intelligent and capable of understanding matters that were commonly regarded as beyond them. By the late 1920s, the subject of Electrical Housecraft had been effortlessly absorbed into household science curricula.

In London, both Chelsea and Battersea Polytechnics introduced specialist courses in electrical science in 1927, and KCHSS followed suit in 1928. In the US, the home economics department of Iowa State College was the pioneer of something called ‘equipment education’; the College launched an undergraduate major in household equipment in 1929, and by the 1950s hundreds of BSc and MSc degrees in household equipment had been awarded, creating of course yet more jobs for women.

‘What gas can do in capable hands’ is the title of a chapter in Maud Cloudesley Brereton’s persuasive volume *Cooking by Gas*. The book was published around 1930 by the British Commercial Gas Association (BCGA) with the scientific help of Margaret McKillop of KCHSS. Its red, black and beige cover shows a woman wearing bright lipstick and rouge stirring a saucepan with a gas cooker in the background. Brereton argued that gas cookers, gas water boilers and gas fires could improve housing and nutrition and save lives, in fact using gas would have a beneficial impact on ‘all the issues of life’. Like Haslett for electricity, she pushed gas company managers to listen to women, and suggested they should consult with ‘well-educated lady advisors’ in adapting gas technology to the home. Brereton was the British gas industry’s public relations specialist, the editor of the BCGA’s journal and author of its promotional material: the gas counterpart of Caroline Haslett, in other words. Brereton was a member of the WES and the Royal Institute of Public Health and the first honorary female member of the Institution of Sanitary Engineers; she was decorated in 1907 by the French Government for her services to international public health. Yet none of these achievements apparently qualifies her (along with scores of other similarly achieving women who populate the history of the household science movement) to be remembered in most histories of the sanitary reform movement.

The effort to technologize housework had a major impact on women’s own technological careers. New technical training opportunities for new occupations opened up in which women

could safely develop their scientific capabilities away from the critical gaze of men. The fight for control of the domestic fuel empire spawned a new occupation: that of ‘lady demonstrator’, also colloquially (and tellingly) called ‘lady demons’. The practice of deploying women to demonstrate, and thus hopefully sell, domestic technology began with sewing machines. In the early 1860s Isaac Singer in New York employed ‘attractive young women’ to operate sewing machines in the window of his shop. An entrepreneurial gas salesman called Edmund Richmond followed suit in the UK in the 1880s by hiring ‘lady lecturers’ to help his business. They gave demonstrations and lectures with lantern slides to illustrate the use of solid cast-iron gas cookers, and they called at gas customers’ homes to give personalised advice. By the 1920s demonstrators were being hired by local energy companies to show how domestic machines were operated and to spread messages about the ease of preparing elaborate three-course meals, launder linens and clean carpets once you had the right source of power and the right device to help you.

The EAW’s Diploma for Demonstrators and Saleswomen, launched in 1931, called for an examination, four years’ experience in a showroom and a test demonstration in front of an audience. By the end of 1932 nearly 100 Diplomas had been awarded and the graduands had taken jobs in industry, in electrical showrooms and elsewhere; for example to demonstrate a new waffle iron in Harrods department store. The role of demonstrator was a career option offering women a gateway to a semi-technical position without the threat of being accused of taking a man’s job. To the electrical industry, lady demonstrators may have been saleswomen, but the EAW saw them, and treated them, as novice engineers. ‘Here is a promising profession for women, which, while not needing full technical training, may be said to be on the fringe of the Technical World,’ proclaimed Caroline Haslett in a Report for the WES in 1919.[7] Hilda Dover, who attended one of the early Demonstrator courses, counselled that, ‘Women who are thinking of taking up a career in Electrical Showrooms as Saleswoman must one and all possess a

pleasing personality, for however great one's technical knowledge, practical or artistic bent, it is the customer's interest which is required first before advice can be given or a sale effected.' This was potently shown, Dover reported, by one Miss Gladys Burlton who demonstrated how a customer would respond (very differently) to a 'self-opiniated, highly technical salesman' on the one hand, and a 'charming sympathetic saleswoman' on the other.[8] But the lady demons had to be careful not to alert the anxieties of the men who worked in the gas and electrical industries; male inspectors and stove fitters were adamant that the lady demons shouldn't be allowed to carry tools or undertake repairs; their role should be decorative and definitely not technical.

Because the lady demons were viewed by male-dominated industry as low-status and marginal, not much of their history has been recorded. But some aspects of their legacy can be recovered today. The celebrated British television cooks Mary Berry, Fanny Cradock, Marguerite Pattern, and Zena Skinner all had jobs as demonstrators early in their careers. Mary Berry worked for Bath Electricity Board and she conducted home visits to educate women in the proper use of their new electric ovens by making endless Victoria sponges. Fanny Cradock worked for the Gas Council. Marguerite Pattern wanted to be an actress but couldn't afford the fees at the Royal Academy of Dramatic Art, so she took a job in Barnet with the North Metropolitan Electric Power Supply Company where her dramatic talents came in useful. In the 1940s, Zena Skinner got her demonstrator training at an establishment called the London School of Electrical Domestic Science and then worked for the Eastern Electricity Board at one of its Hertfordshire showrooms. The London School of Electrical Domestic Science was based in Knightsbridge and flourished in the early 1930s, although it appears not to have lasted very long. It advertised 'interesting, inexpensive courses' leading to a diploma for 'ambitious young ladies', who would thereby be destined to take up 'remunerative careers' as qualified demonstrators.[9]

Diploma-d or degree-d in household science and employed as demonstrators for the burgeoning household technology companies, the services of women demonstrators who could brag in technical language about what the gleaming new domestic equipment would achieve made a difference to them and to the communities among which they worked. For them it was a way of learning science that could lead to other careers in that field. Other women might have chosen to be professors of chemistry or physics or physiology at Harvard or Cambridge or anywhere really, but what they were offered, what was held out to them as within practicable reach, were academic appointments in some variant of the discipline that was household science. This was definitely better than nothing. It was how women inveigled their way (were seduced?) onto a path signposted 'to gender equality' - a destination that still remains shrouded in mist today.

Conclusion

Isabelle Beecher Hooker (half-sister of the famous professional housewife Catharine Beecher), giving a speech in New Jersey in 1882 to a large crowd of suffragettes, urged them to master the plumbing systems in their houses as well as pursuing the vote. A staunch feminist herself, she saw no problem in combining the campaign for a more scientific attitude to housewifery with more conventional feminist causes, and, indeed, the household science movement did achieve many successes for women. Together with the community sociology practised by women in social settlements in Europe and North America, the campaign to make a serious educational subject out of housework is a historically underestimated force driving women's entrance into many areas of public life and to be heard as authoritative voices in policy-making.

And, most importantly, the household science movement had an undisputed effect on health. In countries such as the UK and the US, mortality rates began a steady decline once the domestic science movement had gained some hold, and this was *before* most medical interventions

(except for smallpox vaccination) could have had any notable effect. Infant and child mortality rates, highly sensitive to environmental conditions, experienced the steepest fall. These large declines in mortality rates between about 1890 and 1920 are strong circumstantial evidence that the new domestic science education did actually change household behaviour. Public health reforms improved the infrastructure of the material environment but did nothing necessarily to alter attitudes and behaviour. The list of diseases whose transmission is mitigated by domestic and personal hygiene is a long one: chicken pox, diphtheria, gastroenteritis, measles, meningitis, polio, rubella, scabies, typhoid and viral hepatitis are just some of them. Households that adopted the new sanitary science messages about boiling water and milk, avoiding faecal contamination, and providing safer and more nutritious meals, would have increased their members' survival chances.

The household science movement effectively transferred to the general public knowledge about everyday life generated by scientists in their laboratories and offices. It challenged the public/private divide and shone the spotlight on the shoddy working conditions of women at home. It revealed the falsity and damage of prescriptive ideologies about women as irrational and unscientific and expanded the scope of their public work. For a time, in other words, housework was taken seriously.

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