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This Thesis is submitted in candidacy for a B.Des. in Industrial Design at the The National College of Art and Design, 100 Thomas Street, Dublin 8, Ireland.

MECHANISATION IN THE KITCHEN

1880 - 1945

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INTRODUCTION

For almost 200 years now, the kitchen has been the central focus of the household. Yet it was not until the nineteenth century that it was given any serious consideration. Housework, has always been and still is today a very time consuming activity. During the last century, the inventors, through their inventions and the domestic scientists, through their household management ideals, began to try to solve many of the problems encountered in the kitchen. However it was not until the advent of electricity and its application that any of these inventions helped mechanise the kitchen or any of the domestic scientists saw their ideas put into practice. Then there was a radical change in the kitchen; cleaning, washing and cooking methods were all improved greatly. There were many new products which also emerged on the market and the kitchen itself developed into a more pleasant place to work.

During the nineteenth century many attempts had been made at developing appliances for domestic chores. Although they were going in the right direction, these attempts did not change the actual nature of the work greatly and were often more tiresome and difficult to operate than traditional methods. One of the fundamental reasons for this lay in the fact that scientific knowledge was not adequate at the time for ideas to develop further. As a result many of the inventions were shelved to be rediscovered at a later date

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when electricity and the electric motor made their realisation feasible.

In the early stages of the last century, the question of mechanisation arose in all areas of life. It was a question which was greeted in various ways by many different people. In production, mechanisation was developed in such a way as to change the work process from one on a handicraft basis to one where the machine did much of the work. Instead of each man producing one product at a time, he was now only involved in a small part of the production of that product. In the home a reduction in the labour involved in everyday chores was achieved by the mechanisation of those chores which had once been done manually. This was made possible with the new and superior source of mechanical power electricity. The full development of this mechanisation occurred when electricity and work organisation were combined to create domestic economy.

During the nineteenth century many women, on both sides of the Atlantic Ocean, had tried to develop a domestic science which would be adapted in all households. People such as Catherine Beecher and Mrs. Isabella Beeton wrote books on the subject; <u>Treatise on Domestic Economy</u> (America 1841) and <u>Beeton's Book of Household Management</u> were two of the more popular books of the time. They were intended to make women more aware of methods of organising work in such a way as to optimise on available time. This new science was

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taught at many girls schools, but along with work organisation, hygiene and health issues were also dealt with.

About this time bacteria had been discovered and people strove to clean their working environment more than before. However, due to the primitive methods and appliances available much of this was in vain. In fact, in the case of carpet sweepers for example , more dust rose than ever before. It took the application of electricity to help the plight; from here on the same amount of effort applied to electrical appliances achieved better results than manual methods gone before.

In the decades directly following the introduction of electricity to the home many appliances were developed and put into use than ever before. More importantly these appliances were more successful than similar attempts in the mid nineteenth century. Electricity was to make the mechanisation of the home a reality and no-one could escape its influence. From here on the work process, the role of the housewife and indeed the role of the kitchen within the domestic structure were to be radically changed. What had been a dream less than half a century prior to this was now to become a reality. However with all these changes one thing has remained very much the same. For the full time housewife housework is as time consuming as ever before. Electricity did make domestic work less of a physical toil. However the new standards which became possible combined with the ideals of domestic scientists only increased the housewife's workload. How far forward has electricity and mechanisation really brought the housewife? This thesis will display the appliances which were developed to ease the physical aspect of work and will show us the high standards which emerged with these products. It will then go on to show the way in which housework for the housewife has not really improved.

CHAPTER 1

The kitchen has always been the central focus of the domestic household, yet it was not until the middle of the nineteenth century that it began to receive serious attention. Because domestic labour had never been very difficult to find interiors appliances and work methods had changed very little in over 300 years. The only real change had been in domestic fuelling, where during the seventeenth century there was a general change over from timber to coal. However by the start of the nineteenth century kitchens were beginning to be given more consideration. This was mainly due to the onset of the Industrial Revolution, which brought with it numerous new machines, tools and production techniques. It also brought with it a change in lifestyle for a large proportion of the population.

The typical kitchen at this time had an open fire; although the cast iron range was introduced around 1800, it took until the middle of the century for it to become commonplace. This open fire took up much of one wall of the kitchen ((fig.1 and 2) which also contained work tables, dresser and shelving for utensils. Food was stored in the pantry off the kitchen, and washing up , laundry and ironing were done in the scullery, unless the house also had a washroom.



Figure 1. A typical early nineteenth century kitchen.



Figure 2. A late Victorian kitchen 1880-95.

In the nineteenth century the household might have consisted of up to twenty people. These would have included the family as well as the cook, parlour maids, scullery maids, chamber maids and of course the butler. As the kitchen was the centre in which all food preparation, cooking, water heating and feeding of the household staff was done; it was often a very cluttered and over-crowded place. Much of this was due to the large number of gadgets that lay about the kitchen. These would have included wash tubs, mangles, and various cooking utensils.

At the beginning of the nineteenth century cooking was still being done on the open fire, with kettles and pots suspended from adjustable hocks set into the chimney hanging over the fire. By the middle of the century however the cast iron solid fuel cooker was common place. The installation of the stove provided an oven and enabled the introduction of a back boiler system for heating water. The daily chores of the household staff were guite numerous and the introduction of these 'modern' cast iron stoves only further increased the early morning work. Along with removing the ashes and lighting the grate, the maid now had to black-lead all surfaces of the stove and then polish them. These stoves, while economical on fuel and easier to control than the open fire were not without their problems. Because of their construction the oven was only heated on one side and therefore food was unevenly cooked unless turned regularly

during the cooking. (fig. 1) Also as the top of the fire grate was open the kitchen still tended to fill with smoke. As the century progressed some of these problems were eliminated to a degree by enclosing the fire completely and by introducing flues through which warm air could be circulated to heat the oven more evenly. There was also the problem of the heat in the kitchen which still remained. While in the winter the kitchen was comfortably cosy, during the summer it was unbearably hot and a greater attraction to hoards of flies. It was the 1840's before this problem could begin to be improved and this was helped along by the introduction of gas.

Just as the installation of solid fuel stoves was becoming popular, gas cookers also became available; the first experiments had taken place in 1830 but the first gas cookers actually went on sale in 1850. However due to the fact that the gas cooker could not heat water and also because the idea of gas cooking was a crazy notion to the cook, it was slow to replace the stove. Early gas cookers were also a hazard in the kitchen; a master burner controlled all of the burners and had to be turned off at the mains when not in use or at night. On occasions when this was left on at night, serious accidents would occur the following morning; when the cook lit the burner in the morning the oven would fill with gas and eventually leak out causing an explosion when it came into contact with the top burner. Many of the homes which did install the gas cooker found them useful in helping to keep the kitchen cool during the summer . It was not until the introduction of electricity that the situation really improved and this will be discussed later in chapter 2.

During the mid nineteenth century, many attempts were being made at developing appliances to ease the burden of the many domestic cleaning chores. Most households had a wide and varied collection of brooms and brushes for sweeping floors, walls, carpets and wall hangings. While these products did aid in the removal of dust from the floor and furniture, they did not exactly gather dust and therefore it was not long before dust settled in the room once again. In fact it was very difficult to realistically keep a house very clean



Figure 3 A revolving brush carpet sweeper 1859.

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at the time. Many attempts had been made at mechanising the process, but whereas some were relatively successful, others only created more dust than ever before. A carpet sweeper had been presented around 1800; This consisted of a cast-iron box which contained two rollers along with a roller brush, driven by a pulley attached to one of the rollers. Then in the 1850's many more patents were made for these machines and that in figure 3 shows the working shows the working principle . (Fig. 3) The design claims that 'by means of springs at 'b'the brush bears down on the floor at all times with the proper force. (U.S. patent 24,103. 24 May 1859)' Siegfried Giedion, Mechanisation Takes Command, New York 1948. While it was quite successful in gathering dust, it required a large amount of physical work to actually run the brush over the carpet as the frictional resistance between the brush and carpet was quite substantial. There were also a number of attempts at developing a suction cleaner but none of these were really successful until the advent of electricity and the electric motor.

Another area in which much work had been done during the nineteenth century was that of laundry. Here too many ideas had to be shelved until electricity made them viable propositions and successful products within the household. Until then laundering was to be a chore which caused many problems for the household staff. For a start it was extremely hard work, and due to its nature disturbed many other areas of the normal everyday running of the kitchen.

Water had to be heated up and then carried to fill up tubs and coppers. Many preferred to wash in the open air where a fire was built around the copper or else in a brick hearth. The washing itself often took two days and this was followed by a further two to three days pressing and ironing. A dolly, which resembled a stool with a long handle, was used to agitate the clothes in the tub while boiling. The process was very laborious and required a certain amount of physical strength. Attempts were made to mechanise the process but none can be said to have reduced the amount of physical effort and time required to do the wash; they depended on human effort for mechanical energy. Most of these machines consisted of a large wheel which when turned moved a dolly (fig. 4) back and forth.(fig. 5) All of the inventions were based on traditional methods of washing where the aim was to push the water through the fibres by continuous agitation. While they were successful in terms of sales, many of them were not any more successful at washing than traditional methods. They were however ideas which were stunted purely by the fact that man's scientific knowledge was not advanced enough, it was not until the advent of electric motor that they were able to be developed in a practical manner.

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Since the seventeenth century there had been two types of iron in use; the box or slug iron and the sad iron.(figs 5-9) The box iron as its name suggests consisted of a hollow container which held the heat source, the slug. This was



Figure 4. Wooden dolly stick of the 1900's.

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Figure 5. A wooden washing machine with a mangle c.1890.



Figure 6. A slug iron c.1850.



Figure 7. A flat iron with its stand c.1870.



Figure 8. A cast-iron sad iron c.1900.

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Figure 9. A charcoal box iron 1900's.

removed at regular intervals to be re-heated, some contained burning charcoals whose temperature could be raised by pumping air into the hollow using bellows. Sad irons on the other hand were heated by standing them on the stove; these were quite difficult to keep clean as soot was inclined to build up on the sole. What was required however was an iron with a continuous heat source, for at the time the existing method of ironing was a long drawn out and uncomfortably hot one. There were also attempts around 1850 to attach the iron to the gas mains in order to maintain a continuous heating system.(figs 10 and 11) The iron itself contained a gas burner and was connected to the mains via a gutta percha flexible tube. This system also proved a hazard, as the connection tubing often became disconnected and was therefore inclined to cause explosions and kitchen fires. Like many other appliances the iron had to wait until it could benefit from electricity for its further development.

It was not only in the area of household appliances that radical changes were being attempted. Since the end of the eighteenth century moves had been made in the mechanisation of production and this had begun to occur in the household by the middle of the nineteenth century. In production, mechanisation developed in such a way as to change the work process from that with a handicraft base to one where the machine did much of the work. Also, now, instead of each man producing one product at a time, he was now only involved in one small part of the production of the product.Yet it was



Figure 10. A gas iron c.1907.



Figure 11. A housewife using a gas iron attached to the gas mains c.1900.

not only machines which encouraged this or indeed enabled it: the new system called for a certain amount of organisation, then known as Scientific Management. This method of production aided in increased economy of time and an increase in the volume of products possible to be produced. In a similar manner the household began to develop methods of organising the work load and of cutting out much of the wasted use of energy which tended to occur.(e.g. re-heating irons and boiling water for washing clothes) Unlike that of production, the introduction of the organisation of the work process occurred in the household due to many social problems which were beginning to develop. In America, more so than in Britain, the status of the woman and of household servants was beginning to change. By approaching housework in a manner similar to that of production, where certain jobs were done in a particular way, women hoped to retain a certain amount of their own dignity while continuing to play a prominent role in the household. Also since the advent of the Industrial Revolution, in the latter decades of the eighteenth century, acquiring servants had become a problem. This problem was mainly due to the fact that there had been an increase in the amount of work available outside of that related to the domestic service. This type of work then lead to a growth in the middle class furthering the demand for servants. Another reason was, that those who would normally be employed in the household, were now working in these new jobs; therefore the only people left to work in the household were what were

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termed unskilled workers. It was now necessary for the lady of the house to go back into the kitchen. One person who in her writing dealt with these new problems was Catherine Beecher (1800 - 1878). She was the daughter of a New England minister and in a logical manner she considered the problem of housework and its organisation ' housekeeping for her was not an isolated problem, but one which grew out of the feminine question as a whole'S. Giedion, op.cit. p514. In her Treatise on Domestic Economy (New York 1841) Catherine Beecher informed women of the roles which each could play as a vital worker for America. It was through women that the reformation of society was hoped to be achieved.At the time these women believed that the housewife could aid in the improvement of the morals of society. By creating the perfect home it was believed that the housewife could help 'to encourage their husband's religious sensibility.' (Wendy Faulkner and Erik Arnold, Smothered by Invention, London 1985). The publication met with a success which had not been anticipated.Later an English woman tried to achieve the same end/Mrs. Isabella Beeton (1836-1865) had her own book Beeton's Book of Household Management published in Britain in 1861. In it she describes many aspects of household management including the ideal kitchen, duties of the mistress and her staff. In one chapter she recommends labour saving devices and the most essential utensils required in the kitchen. These would include cookery appliances , washing appliances and other cleaning equipment. This book has since been published in many

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revised editions. In it she also describes the role of the woman in the household and society:

'Such are the onerous duties which enter into the position of the mistress of the house..she..ought always to remember that she is the first and last in the government of her establishment; and that it is by her conduct that the whole internal policy is regulated. She is therefore, a person of more importance in a community than she usually thinks she is.'Isabella Beeton, <u>Beeton's Book of</u> Household Management, London 1861, p38.

Catherine Beecher also described methods by which the work process could be reorganised and made more efficient. Even at this early stage she recognised the purposeful layout of the ships galley as one which would also work quite well in the domestic kitchen.

'The cook's galley in the steam ship has every article and utensil used in cooking for 200 persons in a space... so arranged that with one or two steps the cook can reach all he uses.'Catherine Beecher and Harriet Beecher Stowe, The American Woman's Home, New York 1869 p33.

She also described kitchens with continuous work surfaces and more organised storage space.(fig. 12) At this stage she had recognised two of the three present day recognised work centres; those of preservation-storage and cooling serving. However although most of her ideas did have a great deal of validity, many went unnoticed. This was not due to lack of interest by any means; in fact it was a reflection of the actual state of the kitchen at the time. It was not until electricity was introduced to the household that much of what Catherine Beecher professed became feasible. Not one of the developments of the nineteenth century can be ignored as they were to be important elements in the development of the kitchen. In the case of the washing machine for example ,the agitation of the dolly using a cog and wheel mechanism only became practical with the application of the electric motor. Once electricity was introduced into the household in the early 1880's,the domestic structure began to change dramatically.Without electricity the problems I have just described would still be in existence today; with it what the inventors and domestic scientists were trying to achieve could now become a reality. Indeed in many ways they were a sort of starting point for electricity and its application.



Figure 12. A plan for a preparation and work surface by Catherine Beecher in 1869. It shows the continuous work surfaces she talked about.

CHAPTER 2.

The discovery which has most affected the household since time began was that of electricity. With its invention and domestic application, many barely conceived inventions became feasible and the comfort of many homes was greatly improved. Old ideas for washing machines, vacuum cleaners, and irons with a continuous heat source, could now be developed into realistic and practical products. Everyday running of the household gradually became more efficient, standards of hygiene rose and the servant problem did not loom as large as before.'Electricity was the energy source which opened up an almost unlimited prospect'/Adrian Forty, Open University Course A305 History of Architecture and Design 1890-1939, Milton Keynes 1975, p41). From this point onwards, all that the inventor of the past century had been striving to achieve and all that Catherine Beecher was trying to install in the mind of the housewife was to be realised.

The immediate effects of the introduction of electricity were gradual to start with ;this was mainly due to the fact that electricity was initially only seen as being useful in the area of domestic lighting. But in the three decades since 1880, it had gathered momentum to a level which had not initially been anticipated. While many of the earliest attempts at applying electricity to domestic appliances were somewhat awkward? the attaching of the electric motor to the wooden washing machine being an example of this c in many cases it was also somewhat dangerous, / by 1900 many of the initial problems had begun to be sorted out.

The earliest uses of electricity in the domestic environment were in the area of lighting. Up to 1900 a large majority of the houses still used great quantities of candles for illumination. Oil lamps were also in use but were more expensive. Since the 1840's gas had also been used as a means of illumination, yet it did pose problems. It was not reliable and only gave a rather meagre amount of illumination. There were also many problems with the gas mantles. The gas mantles consisted of impregnated fabric which glowed in a gas flame. However the first mantles which went on sale in 1887, in London, were extremely fragile. In fact they were so fragile that it was considered a great accomplishment to get one home intact. At the time they cost 5/- each, about 25p which was quite expensive at the time; especially when their delicacy is considered. In the early 1900's there were tougher and less expensive mantles being produced. By the time these developments had taken place, electricity had taken a strong foothold as a source of domestic illumination.

Initial forms of electric lighting did have many problems associated with them and were therefore initially unsuitable for domestic use. The light was created by the electric arcing of two carbon electrodes, which caused a bright spark

to be produced. However the pieces of hot carbon which were quite likely to fall off the electrodes were a hazard, rendering it unsuitable for domestic use. It was a method which was used widely in industrial environments such as factories and the service industries, like laundry, which were just developing, and quite often for street lighting. In 1848 both Joseph Swan and Thomas Edison on opposite sides of the world independently developed the filament lamp. Both cases were not entirely successful however. Each of the inventions had similar problems; as the vacuum pump had as yet not been invented, the bulb still contained a certain amount of air. As both types of metal used as filaments tended to burn in air, the bulbs did not have a very long life. By 1865 however the vacuum pump had been invented and both Swan and Edison could further develop their products. The carbon filament used in initial experiments by Swan continued to be used and became the most popular type until the development, in 1911, of the tungsten filament bulb still used today. The figures for bulb production between 1917 and 1927 show how well electric lighting was accepted. Production of bulbs from an Automatic Bulb Machine, built in Britain in 1917, went from 2,500 units per hour in 1917 to 60,000 units per hour in 1927 , when a larger machine was developed to meet the demand. The only thing which slowed the total widespread use of electric lighting was the pace at which the wiring of households was carried out.

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Where electric lighting did introduce the public to the

marvels which electricity could perform, there was still more to come. During the previous century, improvements and any changes in technology had consisted of substituting one form of power for another. The next step in this chain of events was the advent of the electric motor. Although the electric motor is primarily associated with Nicola Tesla, who in America in 1888, developed the first small electric motor, in association with the Westinghouse Electric Company, it was in fact Michael Faraday who, in London in 1831, had discovered inducted currents, who built the first motor. (fig. 13) Because of its nature the electric motor



Figure 13 Small electric motors designed by Nicola Tesla in 1889.

did more for mechanisation and the concept of mechanisation than any other power source before. As Siegfried Giedion has written in his book <u>Mechanisation Takes Command</u> (New York 1948)

'It meant to the mechanisation of the household what the invention of the wheel meant to moving loads. It set everything rolling. Without it, mechanical comfort in the house would have advanced little beyond its condition in the sixties.'Siegfried Giedion op.cit. p556.

The electric motor was unmatched as regards versatility; it could be more quickly and, more importantly, more accurately controlled than any other power source.

With the introduction of the electric motor, everyday household chores began to be less of a vicious toil for the housekeeper/ housewife. It now became possible to achieve higher standards of cleanliness with less effort and time. In 1907 Mr. James Spangler of Ohio, America decided that machines such as the 'Baby Daisy'(fig. 14) were far too labour intensive, apart from needing two people to operate it. He believed that the time for a one-person operated machine had come. His first concept consisted of a tin can, a broomstick, a flour sack and a pump which was driven by an electric motor, (U.S. patent 889,823, 2 June 1908).(fig. 15) The machine worked and in 1908 Hoover, originally a leather company involved in the motor upholstery business, who had bought the rights, began to produce the machine commercially. In comparison with what had gone before the









Figure 15. Electric vacuum carpet sweeper by J. Spangler in 1908



Figure 16. An advertisement showing a servant using Spangler's vacuum in 1908.

product was lightweight and quite easy to manoeuvre.(fig. 16) In fact other companies quickly followed suit; it is also important to note that this first, commercially successful, electric vacuum cleaner in many ways resembled the carpet sweeper of the previous century. As with many other products, the initial forms of many products were derived from their traditional predecessors. In this context the traditional is the product which the mechanised appliance is replacing. These traditional forms were later transformed and replaced by new ones influenced by streamlining. (discussed in chapter 3)

In 1908 an attempt was made at mechanising the washing machine. The motor was attached to one of the hand cranked washers of the time.(fig. 17 and 18) Instead of manually agitating the dolly, the mechanism was now motor driven. As the belt drive remained exposed it was inclined to give frequent shocks. Machines then began to be sold with the option of attaching a motor to the dolly drive; it took a number of years to allow standard motors to be sold with the machine, as voltage and current often varied between different areas. The crude method of attaching the motor to the existing manual machines indicates the conditioning of man up to this time. At first it was not even considered whether or not electricity might have different requirements. This was a reflection of the method by which other scientific developments had been adapted: one development/ power source almost directly replacing what had

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Figure 17. A wooden washing machine with a motor attached c.1920.



Figure 18. An electric washing machine c.1929.



Figure 19. A carbon arc iron c.1880.



Figure 20. An electric iron 1898.
sone before. Electricity encouraged man to examine new approaches; that what had gone before did not have to stand for what was new. We will see this in the development of products later.

Ironing was another area which benefited from the application of electricity. Initial developments were somewhat similar to those in the area of lighting; in fact the same principles were used in both. In this case the arcing between the carbon electrodes provided the heat required for ironing.(fig. 19) Here again pieces of hot carbon broke off when the electrodes were arcing, causing



and build a good rousing fire in it. It will give you some idea of the heat your wife has to endure every time she irons.



You think it's hot, do you? Then what does your wife think while ironing to the accompaniment of a hot stove?

Why not kick that stove out and get her a Westinghouse Electric Iron? Don't you think she would be grateful for it? If you have any doubt about it, you can have an iron on free trial.

Figure 21 An advertisement by Westinghouse in 1909 for electric iron.

damage to the clothes being ironed. In England, in 1891, one of the first electric irons, as we might recognise them today ,was made by R.E.B.Crompton(1845-1940) at Chelmsford , a leader in the electrical engineering field at the time. He was also involved in early attempts at arc lighting. In form they resembled the sad irons greatly and had an electric cable attached in a rather awkward manner.(fig. 20) The base plate, or the sole of the iron as it is called, was similar to that of an electric cooker's boiling ring. These first

(models were quite heavy and initially mainly used in the laundry trade. However, as it developed the iron was the fastest electrical product to become almost 'universally' used, mainly due to the fact that it was possible to connect it to a light socket. In 1909 Westinghouse produced an advertisement (fig. 21) encouraging the man of the house to look at the great discomfort his wife encountered while ironing. It asks him to put himself in the woman's position and to experience the heat she endured while ironing. It then goes on to ask him to make her life more pleasant by buying one of these new electric irons. This was one of the many ways in which the public were made aware of the many advantages of the electric iron.

Of all the domestic chores, the kitchen is most associated with that of cooking. It is also in this area that some of the more important key developments occurred. These are not necessarily the most obvious however. As already stated, for centuries cooking had been done on the open fire and during the nineteenth century enclosed stoves became popular. Gas stoves introduced in 1841, were also becoming popular, but it was electricity, which began to be commercially produced and distributed in Britain in 1881, which was to have the greater influence on the future of cooking. Initially electricity in Britain was produced and supplied by different local authorities. In these early days it was produced for the sole purpose of lighting and was only available in the towns. It took until 1926 and the Electricity Supply Act to establish a Central Electricity Board and further develop the supply network. America was a little slower to introduce commercially produced electricity



Figure 22 The electric kitchen at the Columbian Exhibition in Chicago in 1893.

but in 1893 the World Columbian Exhibition in Chicago gave it the incentive to adopt electricity. This exhibition displayed a model electric kitchen,(fig.22) which showed an electric cooker along with various other electrical appliances. This exhibition caused such an interest in the introduction of electricity to the American home that America soon overtook Britain in its adoption of electricity for cooking. Up to this time Britain had been the world leader in the adoption of electricity in the home.

Although gas had taken over from coal by the end of the nineteenth century, there were little or no improvements made on the gas cooker itself. Gas cookers still continued to be made from the same types of materials as the solid-fuel stove.(fig. 23 and 24) While cooking itself was that bit more efficient, it was not any easier to keep the cooker clean and it still looked as ugly and cumbersome as before. In 1894 the first commercially produced electric cooker came on the market: the Crompton electric cooker.A cooker quite similar to this was also produced in 1895 by the General Electric Company in America.(fig.25) These cookers did not have a hot plate and somewhat resembled a safe. It was not long before these electric cookers began to look like gas cookers of the same period; by now gas cookers were beginning to be produced so as to reduce cleaning. For the next two decades , up to about 1920, the electric and gas cocker developed at a similar pace. In both products the



Figure 23. A gas/coal convertible range c.1900.

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Figure 24. A hand made cast-iron cooker.

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black cast-iron structure was replaced with vitreous enamel finished panels. The hot plates had variable settings and cooking was becoming more pleasurable and less messy. In 1923 the electric cooker encountered a set-back; gas cookers were now being produced with one of the more notable innovations of the time; the oven thermostatic control, known as the ' Regulo'.(fig. 26)



Figure 26 The first cooker which incorporated the'Regulo'1923.

By 1930 electricity had developed its own thermostat and then began to seriously compete with gas. The next development which helped to aid in increasing electricity's popularity was the production of safer and more efficient hot plates. Up to this hot plates were open, so when food boiled it ran into the heating element causing it to short out; these were then followed by solid cast (fig. 27 and 28) iron plates which although reliable, were slow and expensive to run. During the 1930's the fast-heating, tubular-sheathed rings were introduced and after initial problems had been sorted out, they became extremely popular. By the end of the war (World War II) the electric cooker had developed considerably, getting and more economical to use. Many of the developments were made in America and these were then imitated by Britain.

The problem of preserving food is one which man has encountered since time began. It was not until the end of the nineteenth century however that the refrigerator was invented. Since Roman times ice had been used in aiding the preservation of food. During the latter half of the eighteenth century and throughout the nineteenth century ice-boxes (fig. 29) were a common feature of the household, Particularly in America. These ice-boxes consisted of wooden chests lined with zinc or slate for insulation. The food being preserved sat on the blocks of ice which were bought daily from the iceman. In 1805 a method of producing ice had



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Figure 27. Enamelled iron electric cooker 1935.



Figure 28. GEC magnet electric cooker 1912.



Figure 29. Domestic ice box c.1882.

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Figure 30 .Ferdinand Carre's Artificial Ice Machine.

been discovered, but it took a number of years to do so with any great success. Mechanised freezing involves the circulation of a liquid with a low boiling point around a cabinet of some sort. As the liquid evaporates it draws heat from its surroundings causing cooling to occur. This liquid is then recycled and this occurs when the vapour is passed through a compressor, causing it to be liquefied.

As early as 1834 steam driven compressors were installed in breweries and meat packing plants in America. It was 1862 before any form of domestic machinery became available, this came in the form of the Ferdinand Carre's absorption machine, (fig.30) which was first shown at the London Exhibition of 1862. As the machine only produced one pound of ice every half hour it was too slow to be practical. It was therefore a number of years before the refrigerator became available to the home in a manner which was both practical and feasible. In fact it took until the end of the century and the introduction of the electric motor for the refrigerator to become a practical and feasible product for the domestic market. In 1913 the 'Dolemure' was launched in Chicago and in the decade that followed companies such as Kelvinator and the Guardian Refrigerator Company, now known as the Frigidaire Corporation, brought their products onto the market.

Early models were a somewhat awkward marriage of the motor, compressor and storage compartment. In some incidents

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Figure 31. The Kelvinator refrigerator 1925.

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the motor and compressor were housed separately from the storage compartment because of their size. Other models used an approach similar to the early developments of the washing machine, the cooling unit being attached to the storage compartment at the base or even at the top.(figs.31-33) The

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Figure 33. An electric refrigerator 1932, (B.T.H> Co.)

first refrigerators were wooden cabinets, insulated with cork and lined with painted sheet metal. While at first the refrigerator was slow to take off, mainly due to the initial high costs involved, early models cost as much as \$900, by the mid thirties sales had increased dramatically and the cost had gone down to about \$170. Domestic refrigerators were probably one of the earliest of the new inventions to play a major role in the emergence of the kitchen interior of the future - as will be discussed in chapter 3.

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CHAPTER 3

When the Grid System was finally established in Britain in 1926 by the Central Electricity Board the way was made clear for developments in the household. Changes that had begun to occur in the latter decades of the nineteenth and early decades of the twentieth centuries now became more definite and permanent. The many changes in the area of everyday domestic appliances, were soon being reflected in the area of kitchen planning and household management. The aims and objectives of the mid nineteenth century inventors and of people such as Catherine Beecher were now being realised and were, almost entirely, both practical and successful.



Figure 34 Thor electric wash boiler.

By the middle of 1930's washing machines had become better insulated and were now being produced with an enamelled steel casing.(figs. 34-36) The machines were by now almost entirely automatic. In the initial years of the twentieth century, it had been realised that what was actually required to further develop the washing machine was a timer of some sort. This timer would be required to initiate speed changes for the different cycles as well as actually timing the length of the cycle. By 1939 this had been achieved, it became possible to improve the machine further. Variation in the speed of the motor made it possible for many changes to occur. Wringers began to reach obsolescence as the spin cycle could perform the function in an even. more satisfactory manner. With the elimination of the wringer, the styling of these 'new' machines also began to change.

Although the form of the washing machine began to change greatly, the traditional systems were still in use. Washing machines still provide either an agitator or a tumble action; The former usually applied to the top loader, with the tumble action being common to the front loader. Much of the drudgery of the weekly wash had been eliminated and what Mrs Beeton had written in 1883 has proven true right up to today:

'What the sewing machine is to the seamstress, the washing machine is to the laundress; the one will soon be as indispensable to the family comfort as the other.'Christina Hardyment <u>From Mangle to</u> Microwave Oxford 1988,p74.

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Figure 35. Electric washing machine 1927.

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Figure 36. Electric washing machine 1933.

Moving into the forties the washing machine begins to take on a more streamlined appearance.(fig. 37) Streamlining had been introduced as early as 1900 when it was acknowledged that the tear-drop was the form with least resistance.



Figure 37 Electric washing machine 1933.

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Although initially used solely in auto design, in the 30's and 40's it was made popular by Norman Bel Geddes (1893 -1958), with his many streamlined designs, among them the Cold Spot refrigerator of 1935.(fig. 38) While extremely popular and a 'fashion' of the time, streamlining was an ingenious combination of technology and aesthetics.



Figure 38 The Cold Spot refrigerator 1938.

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Throughout the thirties the wash unit had been mounted on legs of a sort, but by 1946 the machine had almost entirely been encased in a somewhat box like form. This was fitting with developments in other appliances, but more importantly it was a reflection of developments in kitchen layout and of the streamlined kitchen. One surface flowed into the next and there were less of the gaps previously known to be seen.

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Electric cookers developed in a similar manner. Through the thirties they too had 'legs', an addition which aimed at giving the cooker a more weightless appearance than the cast iron stoves which had gone before.(fig. 39) They also reflect the easing of the heavy labour associated with meal preparation only three decades earlier. It was during the thirties that the cooker became less expensive and also that more attention was paid to their design. Up to now most cookers had been hired out by the supply companies, but then the actual sales of cookers began to improve. The electric cooker was, by the end of the thirties, quite popular, easy to clean and beginning to merge with the rest of the kitchen. In the early forties the white enamelled range had become an established standard and it too was beginning to show the effects of streamlining.

Of all the work processes associated with the home, food preparation is one which has developed greatly as a result of electricity. In fact the refrigerator can be considered an invention of the electric age and it was this product



Figure 39. Creda electric cooker 1933.

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which went on to play a leading role in the streamlining of the kitchen. From the early twenties , when the refrigerator resembled an ice-box with a cooling system, to the early forties when the refrigerator had gone through an astonishing metamorphosis.(fig. 40) This was mainly due to the fact that new methods of cheaply producing refrigerator bodies had been perfected during the thirties. These methods had been adopted from the automobile industry. While the method did have a bearing on the form it is interesting to note that these forms began to be adopted by other appliances and in particular began to geffect the layout of the kitchen.

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Figure 40 development of the refrigerator in terms of production.

Until the introduction of gas and electricity, the cooking range because of its nature, was required to stand apart from the other elements of the kitchen. Indeed, due to the nature of materials and the operation of the other domestic appliances, it was quite difficult to create some semblance of uniformity in the kitchen.(fig. 41) But the introduction of electricity changed the face of the appliances and the operations associated with them. It was evident that nothing could escape the influence of electricity and the developments that came as a result. The refrigerator, a product of 'the electric age', paved the way for other



Figure 41 A photo showing the type of kitchen which prevailed prior to the introduction of standardised units.

products such as cookers and washing machines. It showed the inventor and manufacturer that, in the case of the cooker for example, the biggest and most heavily clad did not necessarily mean the best and the most economical. Traditional forms, such as the cast-iron stove and the natural scrubbed surfaces, which required daily scrubbing, were now almost obsolete and the traditional kitchen was gradually disappearing.

It was during this period that the coherence between work surface and appliance emerged.(fig.42) Kitchen furniture manufactures were among the first to introduce the idea of

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Figure 42 A kitchen of the mid thirties showing the use of modular units in kitchen design.

standardised units for the kitchen. The units can be combined in what ever best suits the layout of the particular kitchen. The manufacturer had also taken steps, in the production of his products, which enabled refrigerators, cookers and washing machines to be built in to the kitchen storage units and under the work surfaces. The work top had also changed quite radically, scrubbed wood surfaces were being replaced by the new plastic laminates which were developed in 1913, with decorative laminates being produced in the 1930's. These new laminates, known as Formica, provided a hard wearing easy to clean work surface for the housewife.

In her writing Catherine Beecher had described methods of organising the work process. She recognised that the kitchen laycut was as intrinsic a part of this organisation as the breaking down of each chore into its separate elements. Her description of the inefficient kitchen where

'the cooking materials and utensils, the sink and the eating room are at such distances apart that half the time and strength is employed in walking back and forth to collect and return the articles used.' Catherine Beecher and Harriet Beecher-Stowe op.cit. p33.

is that of a kitchen which was fast disappearing during the 1930's. As far back as 1869 Catherine Beecher had envisioned the ideal kitchen and now it was becoming a reality.

The isolated tables, dressers and the disarray of the old kitchens were now being replaced by compact work areas,

continuous work surfaces and a sense of order and organisation. It was only in the middle of the 1920's that architects and interior planners recognised the validity of all that Catherine Beecher had proposed.(fig. 43) Indeed it was only then that it was feasible to develop these ideas in a practical manner.



Figure 43. A diagram showing the work areas as described by Catherine Beecher: a. the preparation area, b. the clearing area

While there were some initial problems with the building in of the different appliances, it was not long before manufacturers began to look at each other's products. This helped in developing products which could be fitted together in an orderly fashion, marking the introduction of standardisation and the streamlined kitchen. The elements which made up a kitchen were standard units which could be added to or subtracted from as necessary. The layout of these units also became a part of their marketing; a 1942 Sears Roebuck advertisement states:

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'Sears will help you plan your modern, efficient kitchen ...where work flows from storage to preparation, from cooking to sewing.' Catalogue, Sears Roebuck and Co.,1942, S. Giedion op.cit. p613.(fig.44)

As many of the products being produced and sold were fabricated from enamelled steel in creams and whites, the decor of the kitchen began to take on these brighter, more cheerful colours also. Kitchens of the nineteenth century had been extremely dull and dreary places. Doreen Yarwood describes such a kitchen in her book <u>The British Kitchen</u> (London 1981).

'Dark green painted walls. Dark brown oil cloth covers the floor ...woodwork of dresser and cupboards painted in brown graining.'Doreen Yarwood op.cit. p26.

The kitchen became a brighter and more pleasant place to work in, unrecognisable to the cocks of the eighteenth and nineteenth centuries.(fig 45) Most had adopted the layout of



Figure 44. An advertisement from a Sears Roebuck catalogue 1942.



Figure 45. Kitchen by the Richmond Gas Co.

the 'U' or 'L' shaped kitchens described by Catherine Beecher. Its layout and aesthetics were forward looking, with developments determined by modern power sources and the demands of modern society; electricity and modern production methods had aided in the streamlining of the kitchen, appliances became more compact and efficient and the consumer now came to expect these standards.

As a unit the kitchen itself changed; it was no longer isolated from the rest of the house and after the past two centuries became a central focus of the household once more. During the eighteenth and nineteenth centuries there had been a move away from the kitchen as the heart of the household, this was mainly due to the increased use of domestic labour. Up to the nineteenth century, in upper and middle class homes, kitchens had been built away from the dining area to ensure the odours of cooking did not reach the diners. The dining area now moved back into or closer to the kitchen, and with this the role of the housewife/keeper changed. (discussed in chapter 4). In the past five decades every aspect of the kitchen had been revolutionised. Cabinets along with refrigerators replaced the larder and the ice-box, work surfaces joined all these modern appliances together in a uniform manner. The kitchens shown in figure 1 and figure 45 became a thing of the past, never to be looked back at. These changes had been forecast by J.J.P. Oud in 1918;

'The aesthetic of modern building will not be based on the building of the past; they will be shaped by the essential characteristics of modern society and technology and will therefore be completely different from those of previous periods.'J.J.P.Oud, 1918 ' Architecture and Standardisation in Mass Construction' in Tim and Charlotte Bentons' <u>Form and Function</u> Open University 1975.

And so it was and is even today.

CHAPTER 4

As electrical networks developed the demand for electrical products increased steadily. Products were finally in the position to be extensively mass-produced and motors and other electrical fittings had become standardised. It was no longer possible to connect small electrical appliances to the light sockets and supply sockets became standard. All houses built between the wars had been wired for electricity and a large proportion of older houses had also made the conversion. By the middle of the 1930's well over 50% of households in Britain had a constant power supply; figures in America were even greater, as there had not been a gas supply similar to that in Britain for electricity to compete with.

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'If the acceptance of the mass produced product is completely in keeping with the spirit of the present time, as far as architecture is concerned, it comes at exactly the right psychological moment.''J.J.P.Oud, op.cit. p65.

This is also true of electricity and its acceptance into society. A point had been reached where innovation and methods of improving the home were greatly designed, yet all or most of the attempts to do so had been foiled by the lack of scientific knowledge and therefore the means to do so. Both scientifically and psychologically man was now ready for the widespread adoption and further application of this new power source.

Early in the development of its application, electricity had

been most prominent in the areas of cleaning: washing, vacuuming, and ironing.(fig.46) Now there was a demand for other products and it was not long before they too began to appear, many of which were totally unprecedented. In fact this flow of new products made the idea of the all-electric kitchen become even more appealing than before. It also aided in bringing the housewife back into the kitchen. Although initial products developed in the electric age were aimed specifically at the domestic servants, their number had been dramatically reduced since the war (World War I), and now these products were aimed at the housewife. They were promoted as status symbols, therefore the wife did not feel that either her position as lady of the house or her dignity were being threatened.

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The manufacturing industry in the early years of electricity had not paid a great deal of attention to the appearance or quality of their goods. For them, there was no real financial incentive in this as the market was small. Companies were afraid to introduce new goods which would generate competition in the market place and possibly threaten their businesses. However for the supply to ultimately become cheaper and dominate as the source of power, a wider range of more efficient products was required. Supply companies began to urge the manufacturers to change their policies assuring them of potential markets and of the profits to be made. In the early thirties the



Figure 46. HMV electric iron 1935.

appliance companies, Sears Roebuck in America and Electrolux in Britain, began to make moves towards improving the appearance and, more importantly, the efficiency of their products.

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Women, especially those involved in the new science of domestic management began employment as consultants at these companies. The manufacturer was preoccupied with gaining a mass market for his products and the new women consultants believed that these products should be attainable by the ordinary housewife. They believed that the woman's place was in the home and that products should be developed which enabled and encouraged this. Following the union of the manufacturer and the domestic science adviser numerous small appliances, previously unknown were launched onto the domestic appliance market, the most prominent being the food mixer, toaster and electric pan. In the mid thirties the electric fron was also developed further. It now had a thermostatic control so the old method of judging the iron's temperature was eliminated; up to this temperature had been estimated by placing the forearm close to the sole of the iron or by allowing spittle to drop on the surface of the sole and estimating the time taken for it to boil off. The iron then went on to become the most common household appliance.

Small electric motors had been developed as early as 1904. In fact that same year a small motor had been attached to a



Figure 47. The 'Universal' electric mixer 1920.



Figure 48. General Electric mixer 1934.

hand beater and produced for the commercial market, but it was not very successful. It had made no attempt at disguising its construction and did not win the confidence of the housewife. It was not until 1918 that the concept was developed for domestic use; (fig. 47) the 'Universal' was a development of the first model and was produced by Landers, Frary and Clark of Connecticut.By 1930 the mixer had been further developed by many different companies; it now had many different attachments and a stand which retained the mixing bowl. (fig. 48) The motor and attachment socket were encased and the mixer had many similar visual aspects to the other developing products at the time. This became quite a popular product and yet another of the elements which aided the housewife in the preparation of the daily meals. It also gave a new lease to the area of experimentation. This was something which was beginning to be expected of her. Electric cookers had meant the introduction of the possibility of cooking a greater variety of food with less of the trouble which may have previously been encountered. Although there had been an attempt to mechanise the mixing process in 1896, it was not until the addition of the electricity and the electric motor that any real steps forward were made with this type of appliance.

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Bread had originally been browned at the fireside,(fig. 49) attached to wrought iron holders or in front of the gas stove, and it was from here that the early toasters took their principles. Electric toasters were being produced in


Figure 49. A brass toasting fork and a brass and iron trivet with a wooden handle.

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Figure 50. GEC Magnet electric toaster 1920.

both Britain and America by 1920; the Magnet in Britain and the Universal in America. (fig. 50) Early toasters had open sides and were not insulated, neither was there a pop-up mechanism as there is in those used today. The bread was held against the sides of the toaster using spring loaded carriers; to brown the second side the bread had to be turned around manually. By the middle of the 1920's a step towards the development of the automatic toaster was taken. It had a dial, similar to that of a telephone, to regulate the timing; unfortunately it was not successful. In 1926 the Waters Genter Company of Minnesota produced the first commercially successful automatic toaster. It was known as the 'Toastmaster' and operated by means of a clock-type timing device, which was adjustable to the desired type of toast. When the set time was complete, the current was cut off and the toast ejected. Since then the toaster has not changed greatly, except in terms of styling and one or two further technical developments, none of which was as prominent as that of electricity. Early models of the toaster, as we recognise it , were made with chrome bodies, very much a part of the streamlined casing which was predominant at the time. The clock-type control was, in 1930, replaced by the introduction of a silent, bimetallic heat sensor. The sensor, which was also adjusted to the type of toast required activated the current shut off switch and signal light or bell when ready.

The scientific management of the home also came to the fore

during the thirties especially in America. Manufacturers of appliances, kitchen fittings and kitchen furniture examined every aspect of day to day household chores, right down to the finest detail. That which both Catherine Beecher and Mrs. Beeton had written in the mid nineteenth century was now being put into practice. Housework was now being treated as a science, a profession. In many respects it had been both socially and technologically reconstructed. In fact 'it was altered so much that , in the space of one lifetime, every aspect of housewifery has been revolutionised.'Doreen Yarwood, op.cit.p28.

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While the machines which women were being encouraged to buy did in fact ease the burden of many of their daily chores, they did not reduce the time spent in doing housework. What had happened instead, was, that certain chores were made less difficult and less time consuming by the introduction of electricity. This also made it easier to achieve a higher standard of results than before with even less effort. The introduction of these products had brought about a move towards higher standards and indeed these were far beyond those ever imagined in 1840. Now any time which had been saved was **spent in** doing other chores, created by new products, or in repeating the same chores more frequently. In 1930 an article in the 'Ladies Home Journal' outlined what was happening:

'Because we housewives of today have the tools to reach it, we dig every day after the dust that grandmother left to a spring cataclysm. If few of us have nine children for a weekly bath we have

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two or three for a daily immersiom 'Ladies Home Journal 'May 1930, Adrian Forty Objects of Desire London 1986, p210.

While the housewife has been lead to believe that mechanised products could replace the, by now almost extinct, servant, this was far from the truth. The mechanical servant was a myth and 'the myth that the work once done by servants has been taken over by gadgets and machines' (A.Forty op.cit. p209.) was one used to promote the notion that what the housewife was doing was 'not really work at all, but some other kind of activity.' (A.Forty op.cit., p208.) In many ways we can say that the mechanisation of the home and domestic science had conflicting goals; while one sought to ease the burden of housework and allow the housewife more free time, the other was aiming to draw her back into her 'place'.

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Although electricity was helping the housewife move towards her liberation from housework, domestic scientists had almost prevented it by introducing the notion of raised standards and the new status of the housewife. Instead women were beginning to feel, once more, that being in the kitchen meant that they were 'just a housewife'. For some women the advantages of mechanisation and organisational techniques had been recognised and paid-employment outside the home became an appealing option. Although working outside the home did reduce the amount of time actually spent in the home these women continued to do their housework, but spent less time at it. In spite of all the domestic scientists had done in trying to raise the status of housework, men still considered it below them. The working wife therefore still continued to do the housework, even when the amount of time she spent in paid-employment was the same as that of her spouse.

'One conclusion which can be drawn from available studies is that the housework both expands to fill the time allowed to do it and contracts when time is set aside for other things - such as paid work.'Wendy Faulkner and Eric Arnold <u>Smothered</u> By Invention, London 1985, p175.

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Although the amount of time spent in doing housework by the working woman; is clearly reduced this does not reduce the amount of housework she is required to do. Neither does it mean that standards required can drop. It is clear that in many ways there were those who saw the advantages of the electric home and the application of household management and made use of them. There were those who still felt that unless they spent every waking hour in creating the perfect home they were less than the 'perfect wife'. In terms of hours per week the actual work which the housewife does would have appeared to have risen greatly. Between 1929 and 1958 the average weekly hours spent in doing housework, by the British wife, had risen from 59 to 67. Another reason for this lay in the magazines which were now coming into circulation, Good Housekeeping being one of the most popular. Many women aspired to having homes as depicted in these magazines. There were also a great many of the new electrical products being advertised. These advertisements aimed at informing the housewife of the way in which they

could help her to achieve THE PERFECT HOME.

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CONCLUSION

It is true that not all of the changes which occurred during the sixty-five years between 1881 and 1945 were as a direct result of the introduction of electricity, however it did play a great part in furthering social change. During the war years women had replaced men in the work place; (factories and offices)This meant an increase in the family incomes.It also left women more dependant on mechanical devices as they were still expected to be 'good' housewives and mothers.Up to this time any mechanical advancements which had occurred were no less tedious than what had gone before. It was electricity which helped to change this state of affairs. If the invention of electricity had not occurred, the modern day kitchen would not be much different from that of the last decades of the nineteenth century.

It is now possible for one person to run a house successfully, single handedly and in some cases still have time to spare or have a job outside the home. This is **something which** Catherine Beecher could not have imagined. Today, mainly thanks to the many appliances which developed as a result of electricity, homes and families are cleaner and healthier than ever imagined in the last century. During this period of the electrical mechanisation of the home, many more appliances were introduced to the home than in the whole of the previous century, many of which became 'absolute' necessities; these would include the electric kettles, irons and vacuums.

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In the initial stages of the application of electricity much of its future as the sole power source depended on the credibility of its associated products. After a rather slow start, both supply and manufacturing companies became aware of the need to develop their markets further through advertising; this can be seen in both figures 21 and 44. Of course most of these were only aimed at women. This shows that while there had been an effort to raise the status of housework, there was still a very definite 'division of labour' in the home. Men continued to assume housework to be beneath their dignity. While electricity has removed many of the physical aspects of work in the home, one wonders how much the role of the housewife has really progressed.

'Such a life resembled nothing so much as that of a garage attendant, providing service in the form of food, clean clothes and a neatly made bed to her family instead of oil and petrol to passing cars.' Christina Hardyment op. cit.p18.

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ACKNOWLEDGEMENTS.

<u>Libraries</u>:Trinity College Libary, N.C.A.D. Library, U.C.D. Library. <u>Tutor</u>:Dr.Nicola Gordon-Bowe.<u>Typing</u>:Mel and John for saving the day.<u>Other</u>:Mother for all her help and of course daddy for all his suggestions.