INTRODUCTION

This book is about the cultural problems of early attempts to bring electricity into the home in the late nineteenth and early twentieth centuries. It is thus a study of the domestication of electricity in two distinct but inter-related senses. First it concerns why and indeed whether householders decided to allow electricity into their homes, specifically to illuminate their houses with incandescent lamps. This is the issue of domestication construed as a matter of discretionary appropriation and incorporation of a new technology into the order of household life. In a closely related way this book is also about the extent to which electricity was interpreted as sufficiently *tamed* to be safely, reliably and comfortably introduced to the home. That is the issue of domestication *qua* technocratic control over the enigmatic natural agency of electricity. In this regard the uncertain identity and risks of electricity as well as the controversially glaring appearance and indeterminate prospects of its associated lighting technologies were serious problems. Accordingly I study the efforts by both 'electricians' (as both electrical physicists and engineers were non-disparagingly described during the late nineteenth century) and other male and female allies to deal with these problems, whether successfully or otherwise.

While the geographical focus is on Britain, comparative reference is made to the USA both to avoid national parochialism and to highlight the international dialogue and common cultures in the early domestication of electricity, as well as some key transatlantic contrasts. Put more broadly this book asks why, if electrical consumption has (still) not come to monopolize the cultures of transport, cooking, heating and traction in those two countries, how far and why did electricity ever accomplish unique predominance for domestic lighting and power? To raise this question in a provocative manner, I suspend the assumption that electrification was historically inevitable – an assumption which in any case cannot be supported either by empirical evidence or by counterfactual suggestions that the modern world is inconceivable without electrification. Simply to assume that electricity offered a 'natural' or 'progressive' solution to past cultures' needs for power and light is not just anachronistic but question-beggingly presumes the necessary association of electricity with 'modernization' in ways that this

book seeks challenge. I maintain that the historian must recover not only the particular contingences that led consumers to adopt electricity when and where they did, but also why they rejected it in other contexts. Chief among the factors I appeal to in order to explain the selective take up of electricity are the romantic and even atavistic cultures of magic, mystery, utopia, aristocratic patronage and even traditional marital partnership – very far from the tidily aseptic and dispassionate monolith of modernity.

Overall my argument is that the domestication of electricity was only (partly) achieved with extraordinary effort towards four specific accomplishments that helped to represent electricity as a serious alternative to the long-running technology of domestic gas. First a widespread cultural fear of electricity's apparent threat to body and home had to be overcome; second, effective technocratic management of the hazards of electricity had to be offered to the householder; third, plausible utopian visions of electricity as the key to future cultural harmony and contentment had to be constructed and promulgated to the public and fourth, the aesthetic revulsion to the electric light of many, especially female house managers, had to be countered with an effective campaign to show how the use of 'decorative' shaded lighting could render the incandescent lamp fit for the domestic domain.

Thus I place more explanatory weight than hitherto customary in electrical historiography on the sets of alliances that helped to accomplish these four facets of domestication. These included not just the familiar and less familiar entrepreneurs of electric lighting: Thomas Edison, Nikola Tesla, Robert Hammond, St George Lane Fox and numerous other technician-popularizers. There were also three electrical engineering couples: Alice and James Gordon; Maud and Edward Lancaster and Constance and Charles Peel who worked within a significant gendered division of labour to communicate the taming of electricity to both male and female audiences. A further important loose grouping to which I refer is the technophile aristocracy notably Lord Salisbury, Lord Thurlow and Lady Randolph Churchill, all of whom showed strong political, financial and domestic support for the innovation of electric lighting in ways under-recorded by previous historians. Finally I draw attention to the support for the domestication of electricity made by selectively sympathetic press reports not just from the electrical engineering journals, but from such bastions of the Establishment as the London *Times* and the Anglo-American *Review of Reviews* founded by its radical Congregationalist editor William Stead in 1890. Notwithstanding the partisan scaremongering of the *Journal of Gas Lighting*, liberal reporting of reputed electrical accidents by a wide range of newspapers and the gossipy sharing of anxieties about electricity among servants, these advocates of electrical life persuaded at least some of the wealthier and more adventurous citizens to domesticate electricity. And it is through the promotional work of

such advocates that we will get occasional glimpses of the household consumers deliberating on whether and when to domesticate electricity.

Uncertainty

The first major theme in the book is that both laity and experts – crudely demarcated in such terms and thus easily over dichotomized – encountered electricity with a considerable degree of uncertainty, as reflected in contemporary representations of electricity as both mysterious and hazardous. Not even the expertise of authorities was unequivocally sufficient to meet public demands to explain what the mysterious agency of electricity actually *was* and whether it was safe. Such points of uncertainty were the starting point of my first book *The Morals of Measurement* in which I argued that physicists and engineers used measurement devices to cope with what they could otherwise not characterize by quantification.[1] As I argued in the final chapter of that work, this uncertainty posed a particular problem, however, to designers of domestic supply meters who had to cope with consumers' bafflement at the immaterial nature of electricity and the improbability of being able to measure the intangible consumption of electricity in any trustworthy way.

In this book I take this theme of uncertainty further and pursue as key issues what 'authorities' in electricity did *not* know but were expected by the laity to know (the nature of electricity or the exact nature of its hazards). I suggest that experts' strategy for dealing with uncertainty was that, finding the informed public both dissatisfied that they did not know what they 'ought' to and bored by their technical didactic writings, electrical specialists offered alternative narratives of futurism and luxury as substitutes or diversions from their problematic absence of certain knowledge.

Domestication

Recent techno-cultural scholarship has developed an alternative to somewhat deterministic analyses of the putative 'impact' of new technology arriving in the home. The literature on the 'domestication of technology' presents a more plausible and interesting account of artefacts as needing to be 'tamed' by householders to assimilate them to appropriate performance in the home and this process of domestication is characteristically prolonged, fallible and reversible.[2] Domestication is not only treated materially but also symbolically: an innovation will only gain a permanent footing in the home if its role is made meaningful and unthreatening to the household economy of values. Chapter 1 of this book draws upon and historicizes this important new approach to analyse early attempts to promote the introduction of electricity into the home. Treating domestication at a metaphorical level I address the related, and very public, problems confront-

ing experts' attempts to tame electricity theoretically by producing contemporary ontologies and to tame it practically by new species of technologies. As indicated above, neither was easily accomplished, or indeed accomplished to the satisfaction of both consumer and expert. In the face of much authoritative nescience and not knowing themselves what electricity was, householders sought assurances about how it could be managed within the home so as to accomplish safety and possibly even elegance of illumination. They were thus offered rhetorical and technological solutions to problems of bodily contact with potentially dangerous wires and with aesthetic discomfort under the clinical gaze of the electric lamp.

The need to show the taming of electricity by technology helps explain, I suggest, why busy electrical specialists in the 1880s and 1890s diverted attention away from immediate problems with domesticating electricity towards the future promise of technological mastery in coming electrical utopias. At the same time, however, they faced stiff competition from rival gas interests who were equally determined to establish gas lighting as the principal domestic medium of illumination, heating and cooking. Thus electrical engineers in the 1880s sought polemically to highlight the health hazards of gas lighting to undermine the prospects of the obvious alternative to electricity. The mere fact that such roles in culture-moulding had passed by the early twentieth century from technical specialists to emerging sub-communities of popularizers and lay-experts should not distract us from observing that self-serving prophecies of complete electrification by the former group were not borne out in practice. By comparison with Anne Clendinning's study of the highly effective role of women 'demons' (gas demonstrators) in promoting *fin de siècle* domestic gas consumption,[3] I will explain why electric cooking and heating were not by any means as 'universalized' as electric lighting.

Electricity

The third overarching theme of the book is an examination of what was meant by the term 'electricity' in the pre-1914 period when its potential arrival in the home prompted a growth in specialist literature more spectacular than that evinced by the advent of telegraphy and telephony before 1880. Underlying the question persistently posed by 'What is electricity?' were (at least) four different understandings of the nature and significance of electricity: the physical nature of electricity as presumptively discoverable to science (by analogy with the chemical composition of coal gas); the quasi-magical status of electricity as a mysterious craft mastered only by the cognoscenti; the motive power attributed to electricity (as compared to the power of fire, steam or animal energy) and the transformative power of electricity as a socio-historical phenomenon (analogous to railways and empire). Rather than acquiescing in these actors' categories, I

deconstruct these reifications of electricity to show that there was a persistent disagreement on some of the basic premises of the cultural debates involved in the 'what is electricity?' question.

It was, for example, not only ether-obsessed Maxwellians such as Oliver Lodge who tried to argue that there really was no such *thing* as electricity to be discovered, no matter that it was somehow commodified, supplied and charged just like domestic gas supply.[4] While theatrical demonstrations of electricity as a species of magic helped attract audiences and show how it could be tamed, it had to be represented as a mundanely safe product to be consumed without fear of risk in the home within the viable limits of householder's own expertise. While many early representations of 'electromagnetism' interpreted the motive power involved as that of the familiar magnet harnessed to the equally familiar steam engine, this representation seemed unable to capture the sheer distinctive novelty of the power on display at numerous public electrical exhibitions. Finally, the notion of electricity as an agent of socio-political transformation was often anthropomorphized by the electrical industry into a human form (often as a female goddess, servant, fairy or muse, sometimes as male baby, imp or wizard), thus naturalizing the expectation of electricity's rise to maturity and domination (a notion still popular in French culture as *la fée électricité*).[5] Although appealing to some – perhaps more men than women – many female homemakers resisted this progressive-romantic iconography of electricity, preferring gas as the transformative agent of modernity.

Gender

The final main theme concerns the complementarity and symbiosis of men's and women's expertise in accomplishing the domestication of electricity, just as Anne Clendinning has shown similar gendered patterns in the contemporaneous domestication of gas cookery.[6] Traditional accounts of the coming of electricity to the home focus their explanatory endeavour almost entirely on the role of male technicians as if they naturally held the sole agency in social transformation. Thus, for example, Hughes focuses on the system building activities of such engineer-entrepreneurs as Edison or Westinghouse, mentioning but a handful of seemingly marginal females, such as Hertha Ayrton, and does not comment on the female-centred iconography of the electrical lighting publicity that he illustrates.[7] Whereas Schivelbusch and Marvin include some reference to women as household consumers, both emphasize their relative *lack* of expertise or understanding of electricity; both illustrate but do not analyse the visual depiction of electricity as female rather than male.[8] My approach will be to bring out what is hidden in these accounts: the great reliance of male electrical promoters on female expertise to transform a mere technological possibility into

an actual household experience. It was not just that women were by tradition major decision makers about household matters: they had considerable discretion about whether to accept or reject the overtures of the electrifiers.

Much of the early cultural anxiety about electricity centred on the female body, specifically threats to its physical safety and aesthetic appearance; this was the case notwithstanding the other purported health benefits of electric light and the raw empirical fact that before 1904 only men had been killed in electrical accidents. Such anxiety threatened the whole electrical enterprise, with many households resiliently maintaining gas lighting, cooking and heating well into the twentieth century as trusted 'safe' technologies in spite of the gas accidents reported almost weekly in the press. Given the gender-specific nature of authority in Victorian Britain, women's expertise and authority were required to overcome the concerns of female householders in domestic contexts in which men's 'authority' typically was either irrelevant or of limited weight. Not coincidentally, it was typically the spouses of electrical engineers who took on this role – whether voluntarily or otherwise – Alice Gordon, Maud Lancaster and Constance (Dorothy) Peel.[9] As we shall see, all of these women played a substantial social and technical role in showing how well electricity *could* be domesticated. Nevertheless, this crucial role was not publicly acknowledged by the male-dominated electrical industry which later wrote such women out of their historical accounts of the purported *inevitability* of the success of electric lighting, just as much as they overlooked the hundreds of theatrical dancers who sported potentially hazardous electric jewellery to 'prove' that bodily security could be attained even in close proximity to electric lighting. Instead, the industry's standard approach was to personify electricity as if it had its own momentum to enter into the domestic domain, albeit with significantly ambiguous gendering of this anthropomorphized identity.

To articulate the basic argument of the book, I divide it into three sections corresponding to the general issues of how domestication and electricity were understood by contemporaries; how electricity posed concerns of safety and danger; and, lastly, how the gendering of electrical culture – both socially and iconographically – played a crucial role in the partial domestication of electric lighting. Chapter 1 contrasts the 'domestication' approach with historiographies of both 'electrification' and 'modernization', illustrating how the allegorical themes of taming and training lightning had a high profile in the history of popular promotion of electric illumination. Chapter 2 looks at the many meanings of electricity from the perspective of the history of science communication, raising some important concerns about what exactly was undergoing domestication and how communicating the understanding of this process was fraught with problems linked to the contested identity of electricity.

Chapter 3 looks at a much publicized case study of an accidental fatality linked to electricity in December 1881: the death of Lord Salisbury's garden

labourer William Dimmock. By looking at how interpretations of his death multiplied with an ever shifting identity of the victim and causes of his demise, we can understand how fears of electricity were widely propagated in the 1880s and later. Chapter 4 then considers how the reputation of electricity as 'safe' was constructed by technocratic measures such as fuses and special insurance regulations for wiring, as well as the deployment of female dancers clad in electric jewellery to demonstrate that electric lighting on the body need not cause corporeal harm let alone death – unlike the paraffin and gas lamps that preceded them in the theatre. Chapter 5 continues by showing how much discussion of the domestication of electricity came to rest on engineer's projections of an electrical future that appeared to make the domestication of electricity both inevitable and indeed the very epitome of progress – the domain of the self-fulfilling prophecy.

Chapter 6 looks at the process of aestheticizing electricity, showing how a significant negative response from women to the apparent glare of electric light provoked something of a crisis for promoters of electric lighting that was in part solved by Alice Gordon's book *Decorative Electricity* (1891) which showed well-to-do ladies how to transform their homes into elegant apotheoses of indirect and romantically installed illumination. Chapter 7 concludes by showing how the entire process of the domestication of electric lighting was accompanied by a gendered iconography of electricity in both male and female forms, as if the problem of the unknown identity of electricity could be resolved by anthropomorphization of this mysterious agency into familiar cultural figures that were distinctively either male or female. I conclude with some thoughts on the limited success of the domestication project in the face of competition from gas lighting, and what this tells us both about the history of electricity in the home, and the important historiographical concept of domestication.