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On: 07 November 2011, At: 07:38

Publisher: Routledge

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## Business History

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/fbsh20>

### Symbolic consumption, signification and the 'lockout' of electric cars, 1885-1914

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Available online: 21 Dec 2010

To cite this article: Chris Ivory & Audley Genus (2010): Symbolic consumption, signification and the 'lockout' of electric cars, 1885-1914, *Business History*, 52:7, 1107-1122

To link to this article: <http://dx.doi.org/10.1080/00076791.2010.523463>

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## Symbolic consumption, signification and the ‘lockout’ of electric cars, 1885–1914

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The paper analyses the sources of meanings attached to consumption of the early automobile to inform analysis of the lockout of electric automobiles in the UK, mindful of related developments in France, and the USA. Data are gathered from archive sources, and include social and technical histories and popular newspapers and magazines from the period investigated (1885–1914). The paper asserts that the association of the early car with specific and particular cultural meanings, as defined by class and gender, led to it becoming an untenable choice for early consumers contributing to the ‘lockout’ of the electric car before it had a chance to establish itself as a viable socio-technical system. The conclusion highlights the limitations of an analytical focus privileging technical accounts of lockout and identifies the contribution of the concepts of symbolic consumption and signification.

**Keywords:** automobiles; cars; electric vehicles; lockout; signification; meaning; consumption; technology; social change; business history

### Introduction

In the early days of automotive history electric vehicles were popular and sold well compared with what were seen as noisy and inconvenient early internal combustion vehicles (American Technical Society, 1922). In 1910, in London there were some 6000 electric cars and 4000 commercial vehicles registered (Electric Vehicle Association, 1991), and in its heyday the electric fleet in America grew to over 20,000 vehicles. However the vogue for private electric cars passed quickly so that ‘the gentle electric’ with its silent motor ‘came to be associated with senior citizens’ and ‘lost the imagination of the public’ (Hughes, 1996). Thus by the beginning of the 1914–18 world war the petrol engine had firmly established its dominance (Electric Vehicle Association, 1991; Flink 1988; Nasar, 1982) and by 1933 the number of electric vehicles was down to near ‘zero’ (Nasar, 1982).

Literature concerning the failure of the early electric car points to the importance of touring and the difficulties associated with performing this activity for electric automobiles owing to their limited range and power. Supporters of the electric automobile point out however that the characteristics of the electric car meant that it

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could (even ought) to have served perfectly adequately in some market niches, for example amongst women and business users of the time, in urban settings (see for example Kirsch, 2000; Mom, 2004; Scharff, 1991). Anyone, indeed, who cared about ease of use, wanted or needed to stay clean and did not require a machine for long-distance touring on poor roads would potentially have been well served by the electric automobile. Yet, with the exception of cars for commercial use (local deliveries, taxis), electric cars never sold well compared to petrol-engine variants (Scharff, 1991). Whilst authors have noted this paradox, and have offered some reasons related to the difficulties of charging and over-promising on future technological advances, the underlying reasons for this failure have not been satisfactorily explained. Our contribution to the debate is to revisit this history by offering a novel account drawing both on notions of symbolic consumption and signification, and ideas about technological lockout. In doing so we follow Lipartito (1995) in recognising the need for business historians to treat socio-cultural processes seriously as influential upon tastes and consumption patterns, and thence the success of new objects. Having said this, the paper addresses the complementarity of material, systemic and socio-cultural phenomena associated with diffusion (or non-diffusion) of rival automobile designs, in contrast with previous accounts which have ultimately risked over-emphasising technical explanations.

The focus of this paper is upon the construction of meaning around the car during the late nineteenth and early twentieth centuries, and the role played by this in the 'lockout' of the private electric car. The paper addresses the following empirical questions.

- (i) What did electric and other automobile designs come to mean to early users?
- (ii) What factors are implicated in the construction of such meanings as became associated with the early car?
- (iii) What role did such factors play in the lockout of the electric car from various market niches that it could potentially have served?

It is argued that the construction of meaning around the car occurred with the production and reproduction of car culture associated with the almost exclusive use of private automobiles by wealthy male users for touring and cross-country racing. Sales of cars came to rely upon their being able to meet the performance standards and characteristics set by wealthy male elites for touring and racing – even if they were not actually used for those activities by their owners. Meanwhile cars propelled by the internal combustion engine came to be defined as quintessential symbols of an emerging 'car culture'. The paper is structured as follows. First, the next section presents a detailed review of relevant literature on the topics of the meaning and consumption of objects, signification, and 'technology lockout'. There then follows a section discussing the early history of the automobile, informed by thinking about symbolic consumption and wary of overly technical explanations of the failure or success of developmental trajectories. This discussion is based on a reinterpretation of existing literature and on insights gained from relevant archive data unearthed by the authors, which is contemporaneous with the historical period under scrutiny. The final section summarises the work and contribution of the paper to understanding the role of symbolic consumption and signification in the technological lockout and history of the electric automobile.

The following sections review literature which informs the writing of the paper and to which it seeks to contribute. They centre on the creation of meaning in the context of new objects, and the legacy of technology-focused approaches to the analysis of long-term socio-technical developments and lockout.

### The meaning and consumption of objects

We argue that an understanding of the meanings of emerging technology objects is central to a full understanding of their subsequent success and development. This is particularly relevant to objects that are consumed by private buyers: what objects mean (or are made to mean) is key to their attractiveness. The meanings of an object emanate from an indeterminate number of influences ranging from an object's technical qualities and appearance to the way it is used, debated and framed in discourse. It is possible to 'read' objects (i.e. determine 'what they mean') crudely in purely instrumental terms. A car's instrumentality seems clear from its appearance – it is for travelling over land (Maquet, 1993). However, the meaning of objects goes far beyond this. New objects are also understood in relation to a system of existing meanings (Hebdige, 1988). The car's size and self-propulsion makes it a symbol for technical power (Maquet, 1993), but only so long as there is an established system in which 'technical power' also means something. Having said this, objects can also play a role in shifting systems of meaning. The car certainly played a role in the emancipation of women at the end of the nineteenth century by offering a new arena which could push at the boundaries of how they themselves were understood (Schiffer, Butts, & Grimm, 1994). As objects emerge within a system of meaning they become associated with particular meanings in that system. Thus, Maquet observes that in some poorer nations travelling by car results in the car becoming a symbol of prestige because being able to travel in that way is restricted to a minority, privileged class. Once that meaning is established the reverse also becomes true. Owning a car can also confer that prestige on the owner or user. Objects are thus an important part of self-presentation as they mediate relationships and identities – bolstering the sense of self of the user by visibly demonstrating the user's power and place in the social hierarchy (Attifield, 2000). Indeed, Csikszentmihalyi (1993) argues that objects literally hold their users' identities in place – preventing them from dissolving by acting as 'repositories of meaning about the self' (Csikszentmihalyi, 1993, p. 25). Moreover, they provide evidence of membership of certain social groups and indicate valued relationships (Bourdieu, 1984; Csikszentmihalyi, 1993). Our addiction to materialism is in large part due, argues Csikszentmihalyi (1993, p. 28), 'to a paradoxical need to transform the precariousness of consciousness into the solidity of things ... We need objects to magnify our power, enhance our beauty and extend our memory into the future'.

Meanings attached to consumption also 'signify' membership of a particular group or social class and reinforce existing social arrangements and class distinctions. However, this process of signification is not merely concerned with meanings attached to the consumption of objects *per se*, but is also implicated in representations of use. Recognition of such should for researchers bring into focus the construction of good taste around objects, and how this occurs through cultural and social practices, underpinned by unequal accumulations of cultural and social capital among groups and classes in society (Bourdieu, 1984). This is indeed a phenomenon of great interest to the authors and others, and so informs our analysis of the locking out of the electric car.

### Struggles with meaning

Meanings, it should be noted, are not fixed but are open to manipulation. Styhre and Kohn (2006), for example, show how the marketing department at Volvo sought to shift the meanings of the car within the organisation from a focus on 'production and design' to that of a 'commodity' produced in response to markets. Meaning, however, is not entirely flexible. While writers influenced by post-modernism have tended to see meaning as flexible and fluid (e.g. Styhre & Kohn, 2006) there are distinct problems with this view. As noted, the physical characteristics and appearance of objects restrict the meanings that can be read into them and the creation of meaning for new objects is dependent upon a resource of pre-existing meanings.<sup>1</sup> Hebdige's (1988) description of the scooter encompasses both of these observations. Firstly, the low power, simplicity, low-speed manoeuvrability but obvious 'stylishness' of the scooter limited the meanings assignable to it (power, technical virtuosity and masculinity, do not appear to 'fit', for example). Moreover, its signification as a 'feminine' object was derived in relation to the motor bike which was already understood as 'masculine'. As such the meaning of the scooter has to be seen as drawing on a set of pre-existing understandings about gender characteristics and object characteristics. Fairclough (2005) uses the term 'permanencies' (pre-constructed social structures, practices, identities, orders of discourse and organisations) to describe these resources. Lipartito (1995) considers the rooting of the creation of cultural meanings in the particular practices, beliefs and institutions of specific societies (though we might assert the partial overlap of these across societies in relation to cultural meanings associated with objects produced, consumed or accorded significance across international borders, such as the automobile). Invariably, there is a tension between the established or dominant system of meaning and the possibilities for new meaning brought about by the emergence of new objects. Shifts in meaning can also mark the weakening of one group relative to another; one group simply loses the power to hold its preferred meanings in place (Ivory & Vaughan, 2008). By the same token, the marginalisation of certain sections of society may be contributory to the failure of new objects to diffuse widely, and has been addressed only superficially in prior research on technological lockout, as the following section of the paper will show.

### Technological 'lockout'

A search of the ISI Web of Knowledge database undertaken in September 2009 revealed that very few refereed journal papers specifically containing the words 'technological lockout' in the title (hyphenated or not) have been published (most notably Schilling, 1998, 2002; see also Leydesdorff, 1998; Rio & Unruh, 2007). These results are generated even when searches on the database are done inputting general terms such as 'lockout', though another recent paper refers to 'break-out' in its title (Dolfsma & Leydesdorff, 2009). In comparison a much greater number of articles relating to technological evolution has been published containing the words 'lock-in' in the title or addressing the phenomenon in some way. Other relevant streams of work that inform that of the present paper include research on competing successful and failed innovations, and on system-level technological transitions. The paragraphs below give an outline and critique of these various contributions.

Schilling (1998; see also 2002) refers to ‘technological lockout’ as being: ‘[a] situation in which a firm finds itself unable to develop or competitively sell products to a particular market because of technology standards’ (Schilling, 1998, p. 269). Schilling (1998, p. 271) distinguishes two types of ‘lockout’. ‘Type 1 technological lockout’ occurs when, in the absence of a dominant design in a market, a firm produces products ‘that are subsequently rejected by the market as the market moves toward a dominant design’. Factors contributory to this type of lockout include: a failure to invest in learning; timing (very early entry into a market in which customer expectations are ‘highly uncertain’, or belated entry into a now established market); lack of goods or services complementary to the focal technology; and the extent to which the technology has been adopted commercially – its real or apparent installed base. The latter is ‘directly related’ to the benefits enjoyed by the consumer in using the technology; the installed base ‘strongly’ influences adoption in industries characterised by network externalities, such as in markets involving physical networks like railways, telecommunications and electricity supply grids. ‘Type 2’ technological lockout occurs when ‘[t]here is an existing dominant design and the firm is unable to (or barred from) producing or selling products conforming to this standard’ (Schilling, 1998, p. 278). Factors contributory to this type of lockout include the existence of effective competitor patents and, again, the failure to invest in learning.

Much of the work that has been done on technological lock-in focuses upon asserting and explaining the prevalence of technological lock-in (Arthur, 1989; Cowan, 1990; David, 1985, 1997; Unruh, 2000; Unruh & Carrillo-Hermosilla, 2006), how to escape or mediate the effects of lock-in (Blume, 2005; Carrillo-Hermosilla, 2006; Cowan & Hultén, 1996; Könnölä, Unruh, & Carrillo-Hermosilla, 2006; Unruh, 2002; van der Vleuten & Raven, 2006), or disputing the lock-in thesis (Foreman-Peck, 1996; Geels, 2005; Liebowitz & Margolis, 1995). The influential work of Arthur (1989) addresses the role of chance and insignificant events in conferring advantage on one competing technology over another. David (1985) points to lock-in of QWERTY typewriter keyboards in the 1890s as due to high costs of conversion to a new set of touch-typing skills and complex system of production that was technically integrated (factors which combine to lockout the ‘technically superior’ typewriter keyboard layout designed by Dvorak).<sup>2</sup> The roots of such explanation are economic and systemic in character. Whilst moving the analysis beyond reliance on narrow technical characteristics, they do not account for deeper, emergent socio-cultural phenomena that could explain lock-in – a criticism that also applies to much writing on the early automobile in the literature on technology competition and lockout of the electric variant. This literature and critique thereof are discussed in the next section.

### **Technology competition and systemic accounts of the failure of the electric car**

Implicitly referring to lockout, a number of accounts portray the demise of the private electric car as the outcome of a competition between rival automobile designs. It has been suggested that the electric car was simply an objectively inferior choice in performance terms (Schot, Hoogma, & Elzen, 1994). Even supporters of the electric vehicle are susceptible to this line of reasoning. The Electric Vehicle Association (1991) notes, for example, that the increasing range and power of the petrol engine, combined with the convenience of the starter motor, tempted consumers away from the electric vehicle. Flink (1988) concludes that the electric car

failed because of the insurmountable technical problems faced by electric engines. These included a low power-to-weight ratio, higher manufacturing costs and a relatively short range (lead-acid batteries, even as late as 1910, were only capable of sustaining a discharge for 50 to 80 miles; Flink, 1988). Other explanations of the electric car's demise have focused on systemic issues related to the development of the industry generally. Schiffer et al. (1994) argue that over-eager entrepreneurs like Edison, while trying to push battery development, inadvertently reduced demand by exaggerating likely improvements. Potential customers, he suggests, forever delayed purchasing electric cars as they waited for the promised next step in battery technology. Other related issues included the failure to develop charging infrastructure. Charging was hampered by the lack of diffusion of electricity beyond wealthy homes, currents incompatible with charging batteries and lack of places to charge. Central stations were also slow to see the benefits of the electric car and even regarded them as a nuisance. The batteries themselves were also, at least in their early days, easily over-charged. Maintenance was also difficult, as was replacing batteries and most users had to leave these tasks to experts (Schiffer et al., 1994).

Geels' (2005) account of the transition from horse-drawn carriages to internal combustion engine-propelled automobiles in the USA between 1860 and 1930 draws attention to the wider socio-technical system implicated in transition from the former to the latter variant of the car. In Geels' view it was the wider socio-technical context and recreation of that context that created conditions that were more favourable to the 'gasoline' car than to electric or steam cars – not chance events. However his analysis of early uptake and subsequent lockout of electric vehicles either 'defaults' to explanation of the technical deficiencies of electric vehicles, or accords a secondary role to socio-cultural phenomena. For example, the early success of electric taxis is said to be due to the ease with which they could be started and accelerated and its demise due to the unreliability of the batteries. In the niche of 'promenading in parks', electric cars were said to be an 'appropriate choice' at first due to technical deficiencies associated with 'gasoline' cars. The design of these vehicles as 'electric society cars' to show off the wealth of their users or owners is accorded secondary importance. Thus the lockout of electric vehicles from the above niches (but also from racing and touring niches) is ascribed to technical factors, such as the limited range that could be travelled without recharging the batteries, and the lack of rural battery charging points (Geels, 2005). Fundamentally, this kind of analysis underplays symbolic, socio-cultural dimensions of lockout (Genus & Coles, 2008), to the detriment of our understanding of why, in this case, the private electric automobile did not persist as an object of mass or niche consumption. It is argued here that more effective analysis of the lockout of electric cars requires specific attention to socio-cultural phenomena while avoiding social or cultural (and technological) determinism. The sections below demonstrate the potential contribution of a more nuanced view of the failure of the electric car by addressing issues of meaning, signification and consumption, in the context of socio-technical change.

## **Method**

The symbolism of an object can be read initially in very general terms without inside knowledge of the culture to which it belongs (Maquet, 1993). It can be observed that the automobile is designed to perform certain functions and inferences of uses and understandings of the object draw on this. This reading can be checked with those of

other researchers to test robustness. Maquet suggests a second stage of reading in which the researcher, having made a general first-pass reading, would then also look for detailed evidence of that reading in different aspects of the design. A third and final stage of the process would move to address the different meanings that ‘cultural insiders’ would have associated with the object. This requires more intimate understanding of the context in which the object emerged, or access to cultural insiders. By focusing on issues of consumption, the authors seek to identify those factors that led to non-consumption and, indeed, active rejection of the electric car by the mass of consumers.

As researchers of the twenty-first century seeking to understand objects first built and used towards the end of the nineteenth century, the present authors have sought to draw on the voices of those who were there. To do this, reliance has been placed on media coverage of the time in the form of popular and technical publications, for example nineteenth-century newspapers and periodicals available from the British Library and other archive sources (e.g. those held in Newcastle University and University of Manchester libraries). However, we are also mindful of a good deal of existing historical writing about the automobile. These latter sources add further insights and ground our own analysis in the observations and interpretations of others. Other writers have focused on a range of issues, including both class and gender but without specific regard to how these contributed specifically to the lockout of the electric vehicle. Our analysis explores these connections and in particular why the electric car could not prosper in particular market niches to which its performance was well suited. To explore what the car meant to consumers at the time is a difficult research task; the archive available is immense. However reference to selected archive material here should not be read as intended to infer generality. Rather the use of quotations and comment from archive material is employed illustratively to enrich the narrative and argument of the paper. Moreover, what things ‘mean’ is not articulated directly and has to be inferred from more general discussion. Only the reader can determine whether we have been successful in this regard.

### **The symbolic consumption of the early motor car: the paradox of failure**

The failure of the electric car to take hold in urban contexts has been framed in literature on the history of the electric car as something of a paradox (see for example Kirsch, 2000; Mom, 2004; Schiffer et al., 1994), particularly considering the ‘electrical mania’ of the late nineteenth century. As Kirsch (2000) notes, while it now seems impossible to envisage an alternative transport system in which electrics would dominate urban settings and other forms longer distances, there was no reason obvious at the time why such a system could not have emerged. Such were the apparent advantages of the electric car in its preferred niches and markets (urban settings, use by women and businessmen<sup>3</sup>) that the virtual disappearance of the electric vehicle from them has been a source of consternation amongst writers sympathetic to the electric car, and the mainstay of their argument for its resurrection. Despite the attention placed on this moment of failure, however, thoroughgoing explanation as to why the electric car *was* in fact ‘locked out’ at this historical juncture, and from these preferred niches, has yet to emerge.

In our view, a more nuanced approach involving paying particular attention to the emerging car culture of the time, and the signification of the motor car within it, provides a way out of this impasse. While writers on the history of the early car do



allude to relevant issues (such as the feminisation of the electric car; Schiffer et al., 1994) and its location in class and culture (O'Connell, 1998), none place culture and the related shaping of consumption preferences as the driver of the electric car's failure. As a consequence, their work does not escape the pull of technology-focused and system-focused explanations. We now turn to an analysis of the signification and consumption of the automobile, as mediated by an emerging 'car culture', to explain why the electric car failed to establish itself, even in markets where it was, arguably, a superior technical choice.

It is our contention that emerging car culture promoted consumption preferences that not only favoured the petrol-engined car but that positively discriminated against the electric car. Four key discursive elements can be identified as underpinning car culture:

- (1) the emergence of the car as a means of 'travel for pleasure';
- (2) the signification of the car as an object of class distinction;
- (3) the signification of the car as a masculine object;
- (4) the framing of the car as part of an 'adventure machine' discourse (Mom, 2004), but one coloured by Edwardian notions of upper class masculinity.

Together, and in combination with the material qualities of the petrol-engined car, these elements intertwined to produce a unified and durable 'car culture' discourse which, we argue, shaped the subsequent consumption of the car to the detriment of the electric car.

On the first element it should be said that the car, from its establishment at the end of the nineteenth century, has been associated with the notion of travel for pleasure. There had been attempts as early as 1765 to develop steam vehicles to replace horses for certain tasks (e.g. pulling cannon in France and carriages in the UK) but the technology failed to take hold because of its poor economic performance relative to horse-drawn vehicles and trains. The re-emergence of automobiles in the late 1800s, however, was coloured by something else that had begun to emerge along with the bicycle, the idea of travel for pleasure using mechanical means. Although as late as 1896 it was still argued that the car would never replace the horse (because of their then vast cost) or ever rival the new light railways (the suggestion in parliament was met with laughter; Plowden, 1971), the car had already begun to create a cultural niche that would put it beyond the reach of mere economic calculation. Travel for pleasure was a critical aspect of how the car was understood and consumed and a key element in emerging car culture. 'To possess a car is to become possessed of a desire to go far afield', wrote one enthusiastic city dweller (Wells, 2007, p. 506). 'The limits of the city become narrow, contracted, cramped, cage like. The desire, so to speak, to spread its wings is in the nature of the motor-car, if things inanimate may be said to be moved by desire' (Wells, 2007, p. 506). Others spoke of the pleasure to be gained from 'country travel' (see Burchell, 1905) and 'camping out' (see Wisby, 1905), or motor holidays achieved by means of the touring 'oil motor' (Harper, 1899). By contrast, contemporary reference to electric automobiles highlighted their utility for *urban* public transportation, rather than for long-distance travel, the hiring of an electric cab was seen as a comfortable and easy means of transport around town.<sup>4</sup> The private electric car was for some time an object of hobbyists, such as the Sultan of Turkey, who had an electric dog cart built. But this 'was only a toy of course' ('The sultan's

electric dog cart', 1888). More telling is the comment that the dog cart's makers did not foresee the general use of privately-owned electrically-propelled vehicles in our streets, the tram falling into a different category (*ibid.*).

The early car became an object of class distinction. It was expensive and so unaffordable for the 'ordinary' classes ('On the road', 1899) or indeed for most ordinary business purposes ('The motor-car demonstration', 1896). In a series of talks given at the Automobile Club at the end of 1902 entitled 'Motors for Men of Moderate Means' the speaker estimated annual costs of £335 for a good car (priced at around £525) excluding depreciation. The average annual wage of an adult of that period was no more than 360 shillings (or £18); at that time only 4% of the population was able to leave property worth more than £300 (Plowden, 1971). Woodrow Wilson feared that such was the cost of the car that its 'conspicuous consumption' amongst elites would bring about revolution (Scharff, 1991). Repeated references are also made in UK periodicals of the time to 'motor-car nobility'.<sup>5</sup>

Institutions surrounding the car also played an active role in positioning the car as an object of properly elite consumption. Members of the Automobile Club in the UK were, first of all, themselves 'gentlemen'.<sup>6</sup> In defending its members against criticism in the press for speeding, for instance, the club tried to argue that it was motorists other than those of 'good standing' who were the real 'road hogs' – it was argued that motorists who were not gentlemen may have bought second hand cars.<sup>7</sup> Manufacturers, Wells suggests, were happy enough to capitalise on the 'anxieties and enthusiasms' of the elite of the era by delivering a technology that underpinned their particular pastimes and reinforced their elite status (Wells, 2007).

The initial monopoly of the car by a wealthy elite meant that it was they who set the tone for further consumption as the car diffused more widely. The particular variant preferred (the petrol-engined car), although based on their own preferred uses (touring), would nevertheless have fine-tuned the preferences of subsequent car owners as they sought to mimic the consumption preferences of the classes and groups they perceived to be superior to them. This would have helped ensure that it was petrol-engined cars that were the preferred choice even in urban settings. Indeed, this pattern has been most notably repeated recently, with the popularity of Range Rover-style vehicles, normally associated with country elites, amongst urban drivers who are not necessarily of good standing.

The electric vehicle, by contrast, failed to establish itself as such a robust object of desire. Certainly, the electric car was also viewed as an object of elite consumption – a selling point reinforced in its appearance as literally a 'horseless carriage'. The snob value of electric cars was made clear by US manufacturers like Rauch and Lang, claiming that their cars were built 'as ably as the royal coaches of history' (Schiffer et al., 1994, p. 139) and by Baker which, in its 1911 brochure, noted that the Baker 'has been repeatedly purchased by foreigners of rank' (Schiffer et al., 1994, p. 140). In Europe electrics also enjoyed their own upward mobility, being promoted by wealthy 'celebrity endorsers', such as the Queen Regent of Spain, who ordered an electric Victoria in 1899.<sup>8</sup> They were also promoted by leading pioneering drivers in the sport of 'moting', who initially drove electric cars before switching to petrol engines, including the French aristocrat Count de Chasseloup-Laubat, and Jenatzy who had an electric cigar-shaped car called 'la Jamais Contenté'.<sup>9</sup>

Although they were affordable only to the wealthy, Schiffer et al. (1994) argue that electric cars were purchased primarily by those with less pedigree than those who could genuinely afford the expense of running a real horse and carriage. It is not

hard to envisage that this sense of being ‘not quite right’, in terms of mimicking the consumption habits of superior classes, would have affected their sales in the long term. Moreover, as cultural nuances became better understood such ‘image problems’ would have helped to further edge urban markets toward preference for the petrol-engine car. The distinction conferred by the car on its owner was not just inscribed in the object itself, however. Objects, Law (2002) has argued, are not unitary but fractal – appearing in different spaces and performing different tasks and picking up new meanings as a result of this. To the narrow but powerful section of society which could afford it, the car also meant freedom. The advent of the railways had served to increase mobility but it had also served to make travel cheaper and more accessible. The wealthy classes had enjoyed a brief hegemony over the railways but this was quickly lost as the ‘ordinary classes’ joined them. One commentator of the time described public transport as ‘inflicting a sensation of serfdom which is intolerable to a free Briton’ (in O’Connell, 1998, p. 79). So in practical terms the high cost of the motor car offered a much desired way to regain the exclusiveness of travel and genuine freedom of movement (Schot et al., 1994).

The ability to move freely, one might reasonably argue, is itself a privilege and so a marker of class distinction. This is particularly so in the context of the period under discussion, during which movement was expensive in time and money. The ease of movement the car made possible, in particular beyond the city, thus pandered to Edwardian class sensibilities. Edith Wharton in her introduction to ‘A motor flight through France’ (1909) explicitly links the freedom of motoring to the idea that it is the birthright of a particular class:

The motor-car has restored the romance of travel. Freeing us from all the compulsions and contacts of the railway, the bondage to fixed hours and the beaten track, the approach to each town through the area of ugliness and desolation created by the railway itself, it has given us back the wonder, the adventure and the novelty which enlivened the way of our posting grand parents. (Wharton, 1909, p. 1)

In so doing she betrays a little of the anxieties of a class that sensed its distinctiveness and privilege was slipping away (something she also later wrote about). In part, the seductiveness of the petrol engine lay in recapturing this distinctiveness through the demonstrable privilege of free movement.

The high cost of the motor car thus offered a symbol of recognisable social and economic status (Plowden, 1971) and a way for the wealthy to regain the exclusiveness of travel. The early adopters of the car, in combination with the uses to which they put it, signified ‘motoring’ (i.e. motor touring) as the primary use of the technology with the result that, by association, it became a signifier of this activity. In the context of this culture, a true car was not one that was ‘tied’ to urban recharging stations.

The final thread of car culture derives from the make-up of the car’s then primary consumer (men) in combination with the intrinsically masculine qualities of the petrol-engined car itself (cf. Scharff, 1991), and their association with touring and privilege. Driving petrol-engined cars was dirty, physical and potentially dangerous. Tour racing was dangerous and competitive to the extent that drivers were killed (McShane, 1997), thus marking it out as an inherently masculine activity. Touring cars were also costly and difficult to maintain – their owners would certainly be required to carry tools and be able to use them – complementing the image of masculinity by pointing to a high degree of self-reliance (Borg, 1999). This overall

impression, notes Scharff, was reinforced by the wearing of utility clothing (overalls) which aped those of 'working' men (Scharff, 1991).

Edwardian upper class masculinity was not a broad church. While it embodied rationality and modernity it also held 'adventurousness' and 'daring' as key signifiers: the sort of behaviours that well-bred young men should exhibit if they intended to do well in the wider reaches of the empire (Holden, 2008). Touring was itself a visible expression, and a 'performance', of this brand of masculinity. The 'ordinary lady' was not expected to take to this kind of activity, although 'sportswomen' might ('On the road', 1899). As McCarthy (2007, p. 7) put it, with reference to the US context: 'They [a wealthy American elite] used large, powerful gasoline-fuelled automobiles to set themselves apart and to communicate the message that they were privileged men – that it took money, skill, and "balls" to drive an automobile'. In short the petrol car was an 'adventure machine' (Mom, 2004). The petrol engine, with its specific characteristics and capabilities, enabled the enacting of this particular brand of masculinity – by both men and women – in a way that the electric car, because of its restricted power, ease of use and limited range (with limited refuelling opportunities) could not. In contrast, a less influential view is exemplified in relation to ideas about functionality, comfort and cleanliness. For instance, interviewed for *Hearth and Home*, Rosina Brandram professed a preference for electric automobiles, which she would certainly have (to own) if she were rich enough, as she 'could not stand' an oil-propelled motor car.<sup>10</sup> (Electric) cabbings was considered to be less 'scrubby' than 'growler' hansoms and said to be easier to mount than horses, requiring less agility than that required to enter and leave a hansom, and did not require the passenger to 'hug a wet umbrella, for a neat little chain holds it in place where one cannot fail to see it' (Hill, 1897). Moreover, such 'new horses' were more convenient to keep and run, all the more so when the expected 'electrical stables' (generating stations for battery charging) would come to be (Hill, 1897).

Motor touring, the internal combustion engine-propelled car, masculinity and privilege were self-reinforcing aspects of the same car culture, promoted heavily in the early media of the time (in outlets such as *The County Gentleman*, *Cycling and Motoring*, *Cycling*, *The Horseless Carriage*, and *Outing*; see Ivory, 1992). The popularity of touring was of course a problem for electrics in terms of sales – in that it represented a large market segment and one in which electric cars was not competitive. However the real damage caused was in the promotion of a particular conception of what the car 'meant' to future consumers. This was reinforced in motor shows of the time. For instance, at the Motor Car Club show held at the Imperial Institute, London, on 15 February 1896, four 'horseless carriages' were exhibited. Three were driven by 'oil engines', and one by electricity. They were all 'automobiles', but only one was 'immobile': the electric car. '[T]he other three appeared to answer very well' ('Our van', 1896). Another example pertains to the Stanley Show of 1899, which was observed as one in which its past as a bicycle show seemed to be giving way to a new incarnation as a motor show. However, at the 1899 exhibition there was only one electric car on view, and the principal difference between this and other carriages was noted as being the limited distance it was capable of ('Motors at the Stanley', 1899). The British and Foreign Electric Vehicle Company exhibited seven electric cars at the Stanley Show of 1900, including the 'Powerful' touring car built for Krieger Co. These cars were reported as being 'beautiful' but 'disqualified from touring', due to their need for charging systems, compared with cars run on ordinary oil or petrol.<sup>11</sup>

The predominance of articles and motor shows functioned to close down the interpretative flexibility that would have surrounded the early car by encouraging an interpretation of the 'touring car' as being the exemplar of the quintessential car. Touring thus popularised motoring but at the same time promoted a lop-sided masculinised car culture which served to further lock out the electric car. Some commentators believed that interest in racing and touring would wane and leave the way open for the benefits of the electric car to become more obvious (Schiffer et al., 1994). By the time interest *had* waned the damage was done. A car culture based around a gentler and more refined electric urban transport system, if it did appear, was not sustainable in the face of what quickly became the dominant car culture. Whether or not battery technology or infrastructure improvements would have allowed the electric car to counter the effects of this culture (or indeed to find a place within it) is debatable. We suspect, without wishing to indulge in some sort of cultural determinism, that this was unlikely.

In summary, whilst Schiffer et al. (1994) argue that touring 'drowned out' the voices of satisfied electric automobile customers, we would suggest that 'drowned out' is perhaps not quite the right metaphor. Viewed through the lens of symbolic consumption and lockout we begin to see that, as a consequence of an emerging car culture built around class status and masculinity, the electric car had become a culturally and socially untenable object – even in urban settings. Consumers of cars did not just gain mobility; they also obtained a potent signifier of the privileges of wealth and a particularly bullish and essentially upper class version of masculinity. The electric car's 'limitations' may not have handicapped its functionality in urban settings, indeed as has been argued it had numerous advantages. What it lacked was the signification which could have enabled it to become an object of desire for the primary purchasers of the car, wealthy men and later, as Plowden (1971) notes, men of more 'moderate means'.

## Conclusion

The paper has sought to produce an account of the lockout of the electric car in the UK in the late nineteenth and early twentieth centuries. It makes a contribution to knowledge by offering business history that treats technology culture seriously. Although previous work has highlighted the role of social, technical and system-level factors in locking in the internal combustion engine variant, the account here offers a deeper understanding of the role of signification and symbolic consumption in lockout. We have investigated the relevance of the concept of symbolic consumption in explaining the affinity of actual and potential users with petrol-driven variants and rejection of rival electric designs. The importance of symbolic consumption has been demonstrated in a number of ways. The internal combustion engine variant signified values important to the Edwardian psyche – a mixture of class and narrow masculinity defined by notions of adventurousness and daring. The car, and its early users, thus gave rise to a car culture based on a form of brash upper class, Edwardian masculinity. The electric car could symbolise modernity, practicality, rationalism and wealth but not the excessive bullish masculinity of the early racers and tourers and their cars, increasingly to be propelled ever more powerfully by the internal combustion engine. The inherent inability of the electric car to engender this kind of performance-symbolism nexus continues to ensure its lockout from mainstream

consumption preferences. It follows that increasing uptake of the electric car in future will require this culture to be unpicked either by a reframing of car use implicated in the strategies of manufacturers and policies of governments, or through the emergence of alternative car sub-cultures, socio-technical niches that will see the existing state of the art in electric cars as already reflecting their interests, identities and anxieties.

## Notes

1. See, for example, Lubar's (1993) account of how the use of Greek architectural features on the exterior of early US steam engines was a deliberate attempt to ensure its acceptance in the American 'South'. Southern markets, though not in favour of mechanisation were supportive of the Republicanism of which this architectural style was a motif.
2. The historical veracity of David's account of the QWERTY case is disputed by Lewin (2001), and by Liebowitz and Margolis (1990, 1999).
3. Indeed, the advantages of the electric car in this context were many (Wells, 2007). Electrics were clean, easy to control (no gears); they would not stall and accelerated quickly from a standing start (American Technical Society, 1922). Their ease of use and cleanliness made them popular with town-based businessmen, women and 'theatre-goers' (Schiffer et al., 1994). Petrol-engined cars by contrast were noisy, dirty and relatively difficult to operate (Borg, 1999). The electric engine was also more economical to run than the internal combustion engine (Jenkins, 1902). It also depreciated in value more slowly and was more reliable (American Technical Society, 1922). Although early batteries were not robust these problems were soon overcome and reliability became a selling point (Kirsch, 2000). It was estimated that a single mechanic could look after two electrics for every one petrol-driven vehicle (American Technical Society, 1922).
4. Comment made by the influential motor industrialist Sir David Salomons (1899).
5. *Cycling and Motoring, Our Motoring Section*, 28 July 1900, no. 497, p. 44; *Hearth and Home: An Illustrated Weekly Journal for Gentlewomen*, 2 February 1899, no. 403, p. 489.
6. Interview with Roger Wallace, Chairman of the Automobile Club, in *Hearth and Home: An Illustrated Weekly Journal for Gentlewomen*, 7 December 1899, p. 195.
7. The same point about the social make-up of drivers is made in the following reaction of the club to the possibility of its members being forced to display identification numbers. 'Although such a restriction might be possible on the Continent, where there is not a strong feeling against public identification or the attraction of public attention which is characteristic of the English gentleman, the stigma implied by the numbering of a motor carriage would not be tolerated in this country' – on the grounds that 'numbers are associated in the minds of the public with Hackney coaches etc.' (Plowden, 1971, p. 59). Many owners insisted that they would give up their vehicles if compulsory numbering was introduced. The reaction points to the critical importance of the car, at least in the UK, as a means of social distinction.
8. *Hearth and Home: An Illustrated Weekly Journal for Gentlewomen*, 13 July 1899, no. 426, p. 399.
9. *Cycling and Motoring, Cycling's Motor Supplement*, 21 April 1900, no. 483.
10. *Hearth and Home: An Illustrated Weekly Journal for Gentlewomen*, 7 December 1899, no. 447, p. 202.
11. *County Gentleman: Sporting Gazette, Agricultural Journal and the Man About Town*, 1 December 1900, National Show, no. 2012, p. 1528.

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