MOBILIZING THE HISTORY OF TECHNOLOGY

HOW CAN WE BEST ENGAGE WITH WIDER AUDIENCES?

Colin Divall

Why should we try to engage people who have little immediate interest in the history of technology? The answer for me stems from a strong belief that humanity cannot risk the ecological consequences of extending to the rest of the world the technologically based lifestyles – 'techno-consumerism' – we in the rich global north have come to expect. I do not wish to deny the citizens of the poorer south a decent standard of living: I am simply making the obvious point that collectively we need to find more sustainable and socially equitable ways of living. Technology will play an important part in this transition; it can be part of the solution as well as part of the problem. But why the *history* of technology? Because history has a part – perhaps an important part – to play in encouraging us all to reflect on how the past shapes the ways we think about the present and the future.

In this essay I explore how we might develop a 'usable past' – an unapologetically pragmatic approach to 'doing history' that addresses the challenges of the future. I focus on the history of transport and mobility, a field I have worked in for nearly 20 years. Mechanized transport (planes, buses, trams, ships, cars, trains and so on) is a particular worry because it is often carbon-intensive and because its benefits and costs are unequally shared, both within particular societies and across the globe. It is generally, for instance, the poor that bear the burden of noise, pollution, deaths and injuries, external costs which are often inadequately captured by conventional forms of financial accounting.

Of course, transport policy is usually debated in the context of present-day challenges and opportunities. So what are the advantages in considering transport's future in relation to the past, whether we wish to engage with elites and experts – politicians, policy-makers and analysts, special-interest or pressure groups and so on – or that heterogeneous body, the 'general public'? At a basic level, a historical perspective gives a sense of how we find ourselves in present predicaments. To be a little more sophisticated, I suggest that the ways in which we imagine future possibilities are partly shaped – perhaps without us fully being aware of the fact – by long-standing ideas about what is and is not feasible, ideas that are embedded in particular, historically grounded ways of moving (or indeed staying still). Living, for example, in highly motorized societies such as Finland or the United Kingdom makes it hard to conceive of radical alternatives as anything other than utopian dreams. In short, the more we can show how past ideas and patterns of movement shape our present-day thinking about mobility in both positive and negative ways, the more history might become a resource that helps us to re-imagine the future. These are hardly novel observations: George Santayana's epigram, 'Those who cannot remember the past are condemned to repeat it', comes readily to mind.[1]

On the other hand, it is important not to overstate what history can offer. The past is not a cast-iron guide to the future. The complex world of global flows of people, things and information is open, develops novel and surprising properties, and hence is inherently unpredictable – so historical analysis, no matter how acute and well-grounded, can provide no more than a general guide to possibilities. What, for instance, will be the effect on individuals'

mobility if personal ICTs such as smart phones, tablets and so on become nearly universal? The history of earlier technologies such as the telegraph, telephone and the internet suggests that enhanced communication tends to increase the propensity to travel: but things could turn out very differently in the twenty-first century if, for instance, personal carbon budgets or even rationing start to restrict traditional freedoms of movement. We must also accept that our knowledge of the past is imperfect: the broad-brush history needed to stimulate and inform public and policy debate can mean working with insights and evidence that are 'good enough' for the purpose, even if these do not meet the usual standards of academic 'proof'. There is a real danger here, as I know from experience: that those in power who do not like the implications of historical enquiry will dismiss our findings on epistemological grounds. But, other things being equal, it is, I suggest, worth having as good a historical grasp as we can offer, as long as we are open about the limitations of that knowledge.

More positively, history can help us to see how over the long-term, various combinations of social, economic, cultural and political power operating under particular circumstances shaped choices about the transport networks underpinning today's techno-consumerism: how decisions made long ago apparently lock us into particular ways of moving goods and people (that is, path dependency); and yet how even apparently impregnable transport systems can become obsolete. Who would have predicted, say, as late as 1930 that by 1960 flying would largely have replaced shipping for business travel (not the trans-oceanic shipping lines, for sure); or that even in their industrialized heartlands the railways, once-key elements in global commodity chains, would have been reduced to a comparatively minor role in contrast to road haulage? In such ways, history makes us aware that flux and change are the ultimate reality – and so we should be foolish to assume, for instance, that we shall always be able to satisfy our apparently insatiable desire for higher levels of global trade or personal mobility. And perhaps too, knowledge of the processes and actors that have shaped today's ways of moving can suggest whether, and if so, how, we might individually and collectively intervene to take greater control of the future of mobility.

Cultural histories of transport/mobility

I now develop this argument in terms of personal mobility, ignoring freight – the physical flows of materials, intermediates, finished goods and wastes that underpin techno-consumerism. Freight is an important subject since as well as generating enormous material wellbeing for many people, such flows place huge strains on the ecosystem. It is also a field that is shamefully under-researched from a historical perspective: historians of technology could develop narratives with a strong public appeal – for instance, in relation to food. However that is a discussion for another place.[2]

Here I focus on the apparently unstoppable increase in 'discretionary mobility': that is, travel that in some sense we chose to undertake rather than having to do so – going away for the weekend, perhaps, in contrast to commuting to work.[3] Some policy analysts and scholars in the cross-disciplinary field of transport studies argue that people's choices about whether to travel and how to do so are partly shaped by deep-set attitudes and expectations, not all of which are obvious or amenable to traditional levers of behavioural change such as pricing. These values and norms are reproduced in their fundamentals from genera-

tion to generation. In other words, they are part of a long-standing, or to put it another way, historically rooted everyday culture, understanding this last term in the sense of the shared set of inherited knowledge, ideas, beliefs and values that enable us to live collectively in a society or community. So writing a usable past should involve *cultural histories of transport and mobility*; that is, studies of the ways in which everyday attitudes have fundamentally stayed the same – and perhaps also changed, either incrementally or radically. I shall argue shortly that technology has a lot to contribute to this cultural history.

Let us first consider a little more my basic assertion that everyday attitudes towards mobility matter, and that they have a long history. I suggest that today we are heirs to the beliefs that led the English Victorian historian T.B. Macaulay to claim in 1849 that 'every improvement of the means of locomotion benefits mankind morally and intellectually as well as materially'.[4] Such attitudes are readily apparent in high-level policy circles, as witnessed by this assertion from the UK Department for Transport: 'At the international level, the big challenge in terms of CO_2 emissions is growth in business travel by air (vital to our competitiveness) and leisure travel (important to people's quality of life).'[5] The comparison here with Macaulay is clear: mobility is a good, for all that its side-effects constitute a problem. Certainly the sociologist John Urry argues that in late-modern societies, having the capacity to choose to move freely is both a key resource and a measure of personal status.[6] Urry's notion that mobility is now akin to a kind of capital, a capacity which is both desirable in its own right and which affords wider social, cultural and economic power, is consistent with Macaulay's characterization of locomotion. Indeed such beliefs in the value of personal mobility have probably been an important part of our sense of identity for several centuries, at least in the global north.

If this is correct, then as historians of the usable past we are entering deep waters, for questioning any aspect of a sense of identity, whether at the level of an individual, community or society, can provoke strong emotions precisely because identity is *not* formed through rational considerations alone. This probably goes a long way to explain, for example, the vociferous reactions of that minority of motorists who characterize speed cameras as an infringement on (their) freedom of movement. Furthermore, collective identities are always informed by a sense of a shared past – we are what we agree we 'remember'. However that past might not be one that is consistent with academic scholarship. Indeed the label 'myth', as long as it is used with caution, is a useful reminder that the collective 'remembering' of the past that underpins communal identities can be a very particular and even skewed reading of history.[7]

In this context, debate about the future of discretionary mobility would be much better informed if we had an understanding of whether, and if so how, a sense of the past informs the public's evaluation of mobility as (usually) a 'Good Thing'. In particular, we need to know whether such favourable judgments turn on a grasp of the past that is more akin to 'myth' than 'history'. The key research question is thus not to do with history as such, but with the *modern public's engagement with the cultural history of transport and mobility*.[8]

How does all this relate to history of technology? The kind of research I have just outlined requires a far better grasp of the cultural history of transport than we currently have, not least to provide a benchmark against which to assess public engagement with the past. Here historians of technology have a major role to play. True, the big questions do not uniquely turn on

technological matters. For example, how far back into the past can we trace largely positive evaluations of mobility? Certainly, as I have already hinted, to Enlightenment notions of the self, and back as well to the advantages that freedom of movement gave to those throwing off the yokes of feudal society.[9] The mediaeval right of passage along highways, for example, was an important aspect of the development of freedom of speech.[10] Indeed, acknowledging the intimate connections between freedom and the ideas and practices of movement are critical if we are to gain acceptance for new ways of moving and staying still. But as our genealogy of transport cultures moves into the modern, capitalist era, we need to understand how and why people increasingly choose to travel when they do not have to. Discretionary mobility became an act of consumption, a process increasingly bought and performed in a (capitalist) market. Here historians of technology have much to offer. We can explore how as transport became increasingly mechanized and capital-intensive, technology became a key factor in the making, maintenance and remaking of collective attitudes towards personal movement. In particular, we should study transport technologies as a medium linking people's attitudes to their real-world practice. The material constraints and opportunities of vehicles and infrastructures both shaped and were shaped by attitudes towards movement.[11] This kind of co-construction of the ideal and the material lies at the heart of the *techno-cultural history of transport and mobility*.

Techno-cultural histories of transport

How might techno-cultural history be orientated towards the mobility choices of the twenty-first century? The answers depend heavily on which audience we are trying to address. The policy analyst and 'the public' have different priorities and knowledge, and thus need different approaches. Moreover 'the public' is far from a homogeneous body, not least in its relationship with media. Books, newspapers, TV, radio, the web, social networks, museum exhibitions – it is difficult to gauge just what audiences take from each of these. Crude numbers are not enough, but these are often all we have. On this basis, the traditional mass media are still an attractive proposition, if the relationship between historian and journalist is good (my experience suggests it can be). Museums offer another route to popular audiences, somewhere in size between that of popular books and broadcasting. My experience of working in museums and with broadcast and print media suggests that personalized stories about the past engage many people. This chimes well with the increasing emphasis within academic history of technology on users: how might I have travelled in the past? what vehicles did people use? what was it like? what effect did it have on the way people lived? If people are interested in such questions and stories then it is not too big a step to suggest connections with how people move today and so might do so in the future. Why don't we move like that now? Why do we still move like that? Could we go back to earlier ways of travelling? What would be the pluses and minuses? An important function of history here is to point out that there were often alternatives – paths not taken – to the way that things actually turned out in the past. Doing this kind of counterfactual-but-plausible history can help to reveal 'cracks' in the stories that people tell themselves about the past and present – 'It didn't have to be like that: and it doesn't now.'

A politically important kind of story is the 'techno-myth' of technological progress. As professional or informed-

amateur narrators about the technological past, we are more or less inoculated against the idea that technology always gets better, bringing in its wake a higher standard of living. But this myth still acts powerfully as a 'structural story' in relation to personal mobility. A structural story is a way of absolving oneself of responsibility for the excessive environmental and other external costs one imposes on others by a certain kind of travel behaviour – driving an SUV in the city, perhaps, or flying across Europe every weekend for a short break. A structural story legitimizes such behaviour by making it appear normal and therefore excusable given the practices and trends in wider society.[12] Technological progress functions as a structural story by suggesting that technology will alleviate many of the external costs of modern transport: carbon emissions will fall, other pollutants virtually disappear, personal safety will be enhanced, and so on. This sort of rhetoric enjoys considerable currency among some politicians, and, for instance, airlines and aircraft- and car-manufacturers, which often emphasize the enhanced efficiency of their latest vehicles. Such claims often have clever and solid engineering behind them, and technology *does* have a part to play in reducing pollutants and the other downsides of mechanized mobility. But this rhetoric misses the fundamental point that we live in societies where, for instance, the all-important *total* volume of carbon emissions is increasing because of systems of transport and land-use that are generally still geared to encouraging – and sometimes requiring – longer and more frequent journeys. So dispelling the myth of technological progress is an important part of shifting public attitudes towards mobility.

Technological progress is, of course, a story as much about the past as it is about the present and future: it turns on the belief that technology has delivered on its promises and will continue to do so in the future. So the historian's task is to find ways of getting people to engage with the fact that the complexities of cause-and-effect have not infrequently ended up with the technological 'solution' to one problem leading to another, often unanticipated problem elsewhere.[13] A familiar example is the history of anti-knock additives to petrol, an apparently neat solution to the problem of premature ignition in car engines, which decades later came to be recognized as a major threat to public health. Making people aware that technology is rarely, if ever, a simple fix should not stop us looking to technology for part of the answer to the challenges of mobility in the twenty-first century: but it should give us pause for thought about *relying* on technology alone. The story of biofuels looks as though it will prove a contemporary instance.

How do we make all this attractive to public audiences? Here, as I have already hinted, current approaches to the history of technology help precisely because they understand technological change in terms of human stories: the play of power between individuals, and between individuals and institutions. Consider, for example, the electric car, now welcomed as a possible solution to the challenges of de-carbonizing automobility. The technical obstacles to making the electric car a serious competitor to the internal combustion engine are well known – the comparatively short-range, the lack of an infrastructure for recharging, and so on. Whether these can be surmounted by technical means – better batteries and so on – is not the issue here. I am interested in what history can tell us (and the wider public) about how and why such factors are defined as 'problems'; that is, as something that represents a challenge to the use of the technology in the twenty-first century. By showing that a hundred years ago the electric car was a viable option, we can help to

crack the myth that current technical issues are as significant as they are often thought to be.

For in the early twentieth century the electric car *was* a serious competitor to the internal-combustion-engined auto, despite facing similar challenges to those of today. Different forms of propulsion – electric, petrol, steam – had niches where each thrived. The electric car, for example, was: well-regarded as an urban runabout (shades of today); considered particularly suitable for women because of the ease with which it could be driven; but was by no means restricted to the female market alone. In some cities, for example, electric taxis were a success for many years, not only in technical terms but also as businesses. Why then did the electric car eventually disappear between the world wars? Partly, as Gijs Mom has shown in his magisterial history, because of rapid technical improvements to the internal combustion engine.[14] But these improvements were not decisive, because even so there remained formidable objections to using of internal combustion engines under certain circumstances – for instance, in the city, where exhaust fumes were widely thought objectionable. Equally, if not more important, was the cultural work done by the proponents of the petrol-engined car, work which changed the way that drivers (and others) thought of the technology. The early petrol car was an 'adventure machine', a gendered 'toy for the boys', not least because it was unreliable and took a lot of skill to drive and maintain. But even before the First World War it started to become redefined as an all-purpose machine, perhaps not quite as satisfactory as an urban runabout as the electric vehicle, but 'good enough'. This enabled the petrol car to begin to colonize the electric vehicle's niche – not because the electric car was any the less fit-for-purpose but because it did not have the petrol-engined car's versatility. In short, versatility came to be valued more highly than other characteristics such as low emissions at the point of use. Perhaps today we are witnessing this evaluation being slowly reversed. And while today's technology is not yesterday's, there is a degree of irony in the enthusiasm with which ideas such as exchangeable batteries and on-street recharging stations are offered as innovative solutions to the challenges of making the electric car a usable form of urban transport: in fact, they all have close analogues in the early-twentieth century.

Marketing railway travel

I now turn to a more detailed example of the interplay between academic and public history of technology, a four-year team project, which I led at the UK's National Railway Museum (NRM). This tried to engage both the 'general public' and policy audiences as well as academic peers through an analysis of the ways Britain's railway companies encouraged leisure travel from about 1870 through to the 1970s. Grants of just under €500K covered most of the costs, including about €140K towards the development of content aimed at the public. Both the curatorial and the exhibitions side of the NRM were involved from the outset. The core argument was that as commercial businesses the railways were pioneers in encouraging large numbers of people to travel when they did not need to. More particularly, the companies marketed railway travel as a desirable kind of consumption, initially in the late-nineteenth century as the result of inter-company competition and then in the twentieth century in the face of first road and later air competition. This examination of the railways' 'commercial cultures' tied history of technology into business history and more mainstream histories of consumerism and consumption in Britain – most

of which conceptualize transport as no more than a functional means of moving people and things around. In contrast, we argued that transport is a cultural as well as a material-cum-spatial performance – that is, the physical process of moving from A to B is tied up with socially inscribed meanings such as 'train travel is luxurious'. This conceptual framework enmeshed the history of transport technologies with a social semiotics, deconstructing the meanings of mundane objects such as passenger coaches, built environments such as railway stations, and the forms of travel that take place within and through them.[15]

How does this contribute to a usable past? Let us return to my suggestion of a genealogical history of attitudes towards mobility, tracing the continuities and changes in users/consumers' values. The project I have just outlined focuses on the role of business in shaping and re-shaping these values. In this context, we can trace a path from today's culture of, say, international 'binge-flying' – with all its class and gender connotations – back to the kind of cultural work done by the British railway companies as they sought to build passenger numbers to get some financial return from their expensively built infrastructure and trains. Just like today's budget airlines, the Midland Railway in the 1870s lowered prices to encourage a greater and – as it turned out – more socially inclusive use of transport technologies. As Douglas Knoop, an academic economist, put it in 1913, the policy of reducing fares was meant 'to induce people, who would otherwise not do so, to travel by rail, and to encourage such as would travel a little, to travel more.'[16] Indeed we can push the historical parallels and continuities further, to include market segmentation – that is, recognizing that different kinds of traveller are willing to pay different prices. It is going too far to say that the railways developed anything like the sophisticated yield-management pricing techniques used by today's airlines. Nevertheless, by the early twentieth century, British railway companies had developed an enormous range of discounted tickets in order to 'grow the market'. Just as today, there was a downside to all of this from the users' point of view. Market pricing on Britain's railways was described around 1913 by Emil Davies, a left-wing critic, as leading to 'one mass of absurd anomalies' – a clarion call that today's rail-consumer watchdog in the UK might care to adopt![17] But there again, in Britain lower fares were sometimes associated with higher speeds and greater comfort than abroad. In short, much as today, the British traveller could pay shockingly high fares, but when they got a bargain, which they sometimes could, they might do very well indeed.

Higher speeds and more comfortable coaches underscores the point that trains were not just a functional means of moving from A to B. In reality many third-class coaches were probably as packed and uncomfortable as a Ryanair 737-800, but, excursion trains excepted, the railways did not market discretionary mobility on the basis of high volumes and low prices. The companies represented both the destinations they served and, just as importantly, the experience of railway travel as ways of conferring social distinction on their users. I sometimes hear grumbles that on today's semi-privatized railway in the UK, we are no longer 'passengers' but 'customers', but this is nothing new. Certainly by the 1920s the railways' commercial departments commonly talked about 'selling transport to our customers', and the more we find out, the further back into the nineteenth century we push the date by which the basic techniques, if not always the language, of the modern marketing of leisure travel were introduced. Today's train operating companies try to persuade us to travel 'unnecessarily' by us-

ing methods that are essentially the same as that of their Victorian, Edwardian and inter-war predecessors.

How successfully has this academic research engaged wider audiences? It is hard to tell partly because this is a continuing process, and partly because the NRM has not completed its evaluations of the uses to which the research has already been put. There has, for example, been a greater emphasis on marketing materials in the redisplay of a major exhibition hall, and two temporary exhibitions in the NRM's art gallery have also drawn upon our findings. But the most imaginative use of the research has been in a smartphone app, which offers travellers on the main railway between Scotland, York and London the opportunity to access historical marketing material about the places they are travelling through.[18] The app also provides 360° virtual tours of some key vehicles from the NRM's collections, such as the Midland Railway's third-class dining car from 1914 – a vehicle so comfortable that many people assume it is a first-class coach. The app seems to have captured the travelling public's attention, at least in terms of downloads, and both the NRM and the funding agency – the Arts and Humanities Research Council – are pleased with it.

But I am not convinced that we are yet encouraging the NRM's visitors, whether actual or virtual, to think about how the past continues to shape our thinking about the present and future – although this is something that the museum wants to do. I suspect that visitors might take from the app a sense that marketing travel has a longer history than they realized – that would be no bad thing – but, if they project into the future at all, they probably see it as 'more of the same'; that is, more and more sophisticated marketing encouraging more and more leisure travel. In short I am concerned that the ruptures and even alternative trajectories found in the history of railway marketing – for instance, when travel was discouraged in the second world war – have been lost or smoothed out for public audiences, leading to something that is dangerously close to a progressive narrative of ever-increasing travel opportunities. This is speculation however, and the fundamental point is that we need to know more visitors' engagement with these exhibitions and the app.

What might be done to encourage public reflection on the ways in which we arguably need to break free of the dominant commercial cultures of the past if we are to minimize carbon emissions from personal mobility? I suggest that despite the many frustrations of the actual experience, our feelings about rail travel today are still shaped by long-established narratives about the train's desirability – and that we should be thinking much more carefully about this narrative when we individually or collectively make choices about travelling. In a nutshell, my ideal exhibition or app would present visitors with a sharp contrast between the 140 or more years of a marketing culture that says 'more travel is good' with one that says 'perhaps a little less is good'. By contrasting the long history of railway marketing with a scenario in which 'excessive' mobility is frowned upon, visitors might be encouraged to ponder about why we seem to be so keen to travel more and more.

Perhaps the current app could be adapted to this end. It could give users a sense of the growing power of railway marketing by taking them on a journey through five time zones, four historical and one in the future. The first would be set around 1840, when advertising was minimal, while the next three would relate to the critical periods we researched: the 1870s and 1880s, when marketing started to take off; the inter-war years when it intensified in response

to the first wave of road competition; and the 1960s and 1970s when the railways responded to the growth of the motorway network and domestic aviation. The main experience would be interactive. In each zone visitors would enter a virtual space designed to sell travel, such as a booking hall or travel agency. They would seek out marketing materials and learn more about them and their historical context through object-specific labelling, much as the existing app does with its links to the NRM's collections. In each zone visitors would be able to 'buy' tickets for particular journeys, underlining the reducing monetary costs of leisure travel. The futuristic space will reverse these expectations by surrounding users with marketing *discouraging* travel – connections could be made to the Second World War – and only offering the chance to buy a ticket paid for with (expensive) carbon credits. Might this give pause for thought about whether we can really continue to travel as much as many of us do today?

Concluding remarks

I conclude with some perhaps obvious points, and a few words on where all this might lead. In the first place, life in the global north depends on sophisticated, often energy-intensive technological infrastructures that transport people and consumer goods along with their raw materials, and intermediate and waste products. The propensity of users/consumers to move themselves and their things in particular ways cannot be explained just in terms of the functional utility or monetary cost of one transport mode over another. It is also partly to do with culture and identity – with our sense, whether in the global north, and increasingly in the newly industrializing countries such as Brazil, China or India, that more-or-less unconstrained mobility is a greatly valued part of what we are. The patterns to the way we move today, and the technologies we use to this end, are all shaped by the collective and individual choices made in the past, choices that themselves were informed by historic cultures of transport. Granted that we cannot continue indefinitely with our carbon-intensive mobile lifestyles, we have hard decisions ahead about our relationship to mobility and the technological means we use to achieve it.

All of this suggests that as historians of technology, we should be researching how and why businesses, governments, NGOs, pressure groups, and so on, along with users/consumers have shaped and reproduced these cultures of transport at a range of geographical scales, from the local to the global. Such a history should connect past *ideas and ideals* about mobility to the ways in which transport technologies were *used*. However this will only become a usable past if we keep clearly in view the goal of helping the public, as well as transport specialists and politicians, to see how historic attitudes towards transport still shape our views and choices today. My hope is that by sparking more, and better informed, public discussions about how the past shapes present attitudes, and how these attitudes have been formed by social, cultural and political power, we might be able to start to shift some of the less desirable of those values and even start to develop policies for change that enjoy widespread public support.

Will this happen? Gramsci's aphorism is relevant here: pessimism of the intellect, optimism of the will. Time is short, and apparently getting shorter, and there is a lot to do even in intellectual terms. Add the organizational and political complexities of what needs to be done, and the situation looks even tougher. On the other hand, other aspects of social policy, such as bans on smoking in public places, shows that

radical changes in public opinion and behaviour can be effected fairly quickly, even when these challenge powerful vested interests. But such 'tipping points', for all that they happen suddenly and might appear to come from nowhere, are usually the culmination of lengthy periods of not only expert but also public or semi-public debate.[19] There are plenty of expert – and even some influential – voices bemoaning the ecological unsustainability and social inequities of modern transport, but few, particularly in power, are yet willing to say that more mobility is not *always* a 'Good Thing'. My position is that mobility is neither inherently 'Good' nor 'Bad' – but nor it is neutral, meaning that we need the specificity of historical inquiry to reveal when (and for whom) it was 'Good' or 'Bad'. We historians can help people to think more about transport in the future – but in the final analysis change is a matter of both collective politics and personal practice.

Colin Divall, University of York/National Railway Museum, UK

[1] G. Santayana, *The Life of Reason* vol. 1 (1905) http://www.quotationspage.com/quote/2042.html (accessed 2 Dec. 2013).

[2] C. Divall & R. Roth, eds, *From Rail to Roads and Back Again? A Century of Transport Competition and Interdependency* Farnham, forthcoming.

[3] The category 'discretionary' is historically fluid. For example, in the inter-war decades, many families chose to use new, regular electric train services to live in the fast-expanding suburbs outside London. In that sense, commuting was discretionary. Locked out of inner-London by high property prices, their descendants have little choice about whether to commute.

[4] T.B. Macaulay, *History of England from the Accession of James II*, Vol.1 (n.d. [1849]), chp.3. http://www.gutenberg.org/files/1468/1468-h/1468-h.htm#2HCH0003 (accessed 2 Dec. 2013).

[5] Department for Transport , *Towards a Sustainable Transport System: Supporting Economic Growth in a Low Carbon World*, London, 2007. http://webarchive.nationalarchives.gov.uk/+/http://www.dft.gov.uk/about/strategy/transportstrategy/pdfsustaintranssystem.pdf (accessed 2 Dec. 2013).

[6] J. Urry, *Mobilities*, Cambridge, 2007, pp.194-203.

[7] D. Lowenthal, The Heritage Crusade and the Spoils of History, London, 1997.

[8] Although not yet directed towards mobility, see, for instance, the research programmes being developed at the University of York's Institute for the Public Understanding of the Past. http://www.york.ac.uk/ipup/ (accessed 2 Dec. 2013).

[9] This is the context of Macaulay's remark: he did not intend it as the ahistorical maxim that later commentators have made it.

[10] N. Ohler, trans. C. Hillier, *The Medieval Traveller*, Woodbridge, 1989.

[11] C. Divall and G. Revill, 'Cultures of transport: representation, practice and technology', *Journal of Transport History*, 3rd ser. 26/1 (2005): 99-111. Revised version available at http://www.york.ac.uk/inst/irs/irshome/papers/Cultures%20of%20Transport%20revised.pdf (accessed 2 Dec. 2013).

[12] M. Freudendal-Pedersen, 'Structural Stories, Mobility and (Un)freedom', in T.U. Thomsen, L.D. Nielsen and H. Gudmundsson, eds, *Social Perspectives on Mobility*, Aldershot and Burlington, 2005, pp.29-45.

[13] L. Rosner, ed, *The Technological Fix: How People Use Technology to Create and Solve Problems*, New York and Abingdon, 2004.

[14] G. Mom (trans. J. Wormer), *The Electric Vehicle: Technology and Expectations in the Electric Age*, Balitmore, 2004.

[15] C. Divall, 'Civilising velocity: masculinity and the marketing of Britain's passenger trains, 1921-39', *Journal of Transport History*, 3rd ser. 32/2 (Dec. 2011): 164-191; C. Divall & H. Shin, 'Cultures of speed and conservative modernity: representations of speed in Britain's railway marketing', in B Fraser and S Spalding (eds), *Trains, Modernity and Cultural Production: Riding the Rails* (Lanham, 2011), pp.3-26; H. Shin, 'The art of advertising railways: organisation and coordination in Britain's railway marketing, 1860–1910', *Business History* (online, June 2013). doi: 10.1080/00076791.2013.771333

[16] D. Knoop, *Outlines of Railway Economics*, London, 1913, p.235.

[17] E. Davies, *The Case for Railway Nationalisation*, London & Glasgow, n.d. [ca 1913], p.41.

[18] http://timeline.nrm.org.uk/ (accessed 10 Dec. 2013).

[19] J. Grin, J. Rotmans & J. Schot, eds, *Transitions to Sustainable Development: New Directions in the Study of Long Term Transformative Change*, New York & Abingdon, 2010.