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Negotiating Heritage and Energy Conservation: An Ethnography of Domestic Renovation

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ABSTRACT

What is the relationship between energy efficiency and old buildings? While a large body of research exists on the buildings science and technology of retro-fit, relatively little attention has focused on the social practices and assumptions that shape how and whether these technologies are practically applied. The paper presents findings from an ethnographic study of building professionals, planners and home-owners involved in the renovation and retrofit of buildings of attributed historic value. These perspectives highlight how the value of the past is negotiated in a range of socially specific ways, in relation to ideas about climate change and energy efficiency. It is argued that people's understandings of the past shape specific understandings of 'acceptable change' and that the meaning and value of old buildings is itself transformed in relation to these concerns.

KEYWORDS

Historic significance; conservation; renovation; retrofit; heritage; UK planning; climate change; energy

Introduction

Recent concerns with climate change have led to the desire to improve energy efficiency in buildings of all kinds. While on the one hand, building conservation has been seen as a constraint to the uptake of energy-efficient adaptations, on the other, new building technologies have the potential to threaten the historic significance of the built environment (Figure 1).¹ The paper focuses on the UK where specific building traditions, social practices and regulatory frameworks, situate the relationship between energy and heritage conservation in particular ways. In recognition of the fact 46% of UK CO₂ emissions relate to the energy requirements of buildings and that 66% of existing housing stock will still be in use in 2050,² government policy in the UK has promoted 'retro-fit' of energy efficient materials and technologies through a range of policy initiatives and incentives, notably as part of the Green Deal.³ Although support for sustainable energy has waned under the current conservative government, environmental and economic considerations are likely to sustain the drive for improved energy efficiency in the medium and long term. Of the existing housing stock, 6% are classified by English Heritage⁴ as 'historically significant'. However, the wider importance of considerations of heritage and authenticity emerges when the issue is framed

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Figure 1. Solar PV and uPVC windows on a nineteenth century traditionally constructed Cotswold house. Source: Photograph by Author.

in broader terms⁵: more or less explicitly, understandings of the significance of the past of a building, region or architectural tradition, frame assessments of whether and how modifications are deemed acceptable. By the same token, the impacts of renovation are felt in relation to a wide range of buildings that are attributed historic significance. In this paper, the term 'old building' is preferred to more specific terms including 'historic' and 'heritage' building, a term more commonly used by the subjects of my research, which is resonant of this broader set of ideas.

While the management of historic buildings and energy is nationally and even regionally specific,⁶ the tensions and issues described are of broader comparative interest and concern. At a European level, 30% of housing stock are considered 'historic' by the European Commission, associated with imperatives to conserve valued architectural features that at times conflict with European directives to improve the energy performance of existing housing stock.⁷ In a range of national contexts, the regulation of energy through the specification of thermal parameters of key building components has the potential to conflict with historic designations that value and seek to conserve existing material and aesthetic qualities. While there are relatively few studies from other European contexts, existing work highlights tensions that broadly parallel those described in the U.K. context, notably focusing on: the capacity for thermal upgrades to compromise historic architectural features,⁸ the tendency for thermal calculations to ignore whole life-cycle considerations and therefore to underplay the sustainability of traditionally constructed buildings⁹; and lack of consideration to the adverse effects of thermal upgrades on building performance (for example, a tendency to ignore issues of 'breathability').

While a large body of research exists on the buildings' science and technology of retro-fit, relatively little attention has focused on the social practices and assumptions that shape how and whether these technologies are practically applied.¹⁰ Consequently, while significant attention has focused on the definition of 'good' and 'bad' practice, both in technical terms and from the perspective of conservation philosophy,¹¹ limited consideration has been given to understanding how the relationship between energy and building conservation is experienced and resolved in practice. In relation to old buildings, as more generally, policy attention to the 'what' and 'when' of low-carbon futures, has not been matched by understanding of the micro-practices that account for 'where' and 'how' changes take place.¹² By the same token, professional assumptions of heritage practitioners have often precluded detailed attention to the range of ways in which buildings are attributed meaning, both positively and negatively, as embodiments as a range of ideas, meanings and values.¹³ Even where social factors have been considered, normative understandings of the respective importance of heritage and energy have often precluded attention to the ways in which these concerns are practically implicated in actual processes of decision-making.¹⁴ Consequently, the social factors that explain how old buildings are used and modified, and the range of values that inform these considerations, are still poorly understood.¹⁵

This paper describes findings from ethnographic research that aims to shed light on these processes. Research focused on home owners of traditionally constructed buildings, in relation to the broader nexus of building professionals involved in renovation and retrofit. Semi-structured interviews and participant observation were used to explore whether and how understandings of the past constrain and define the uptake of technologies and interventions intended to promote energy efficiency, in relation to the broader set of considerations that drive renovation. A four-month period of participant observation, based in an architectural practice enabled detailed understanding of the everyday negotiations involved in the renovation of old buildings, including through observations of interactions between planners, clients and other building professionals involved. Semi-structured interviews were undertaken with key participants in these practices, focusing on home owners, but also including architects, builders, planners and Local Authority conservation officers. The buildings were all domestic, selected to represent a range of periods of building and included houses with various historic designations, as well as without. In relation to these buildings, a range of energy-related interventions was considered and applied, with different implications for historic fabric, appearance and technical performance. These ranged from ostensibly less interventionist measures such as the installation of thick curtains, shutters and secondary glazing, to more interventionist technologies including replacement double-glazing, solid wall insulation, solar PV and other micro-renewables.

The study focused on the Cotswolds, a predominantly rural area of England, characterised by a vernacular tradition of building that is widely celebrated as a symbol of regional and national identity. Property prices are generally high, particularly for older buildings, whose 'character' attracts a financial premium. Consequently, most of the home-owners interviewed self-identified as middle-class. Popular understandings of the value of this built heritage are reflected, albeit imperfectly, in a high preponderance of buildings with a formal historic designation, including individually 'listed' houses, and 'conservation areas', recognised as worthy of protection on the basis of historic significance.

From Policy to Practice

In planning terms, the relationship between energy and heritage is managed by various forms of legislation. The U.K. legislative context is specific, but reflects broader global policy, stemming from international agreements in relation to heritage and climate change. Minimal levels of energy performance are specified by legally enforceable building regulations that stipulate the thermal efficiency of building materials and technologies. As for new builds, properties undergoing renovation must adhere to these. For example, replacement windows must be double glazed to specified levels of thermal performance, and renovated buildings are required to meet minimal levels of floor, wall and roof insulation. In traditionally constructed properties, the application of these environmental building standards can be difficult and costly, and can be associated with adverse effects on the structure, performance, appearance and historic fabric of buildings. Even in traditionally constructed (i.e. pre-1910) non-designated properties, planning legislation allows for 'reasonable' accommodations, reflecting the technical difficulties of meeting these specifications and the need to balance energy considerations with the aesthetic and material damage that can result.¹⁶ Historic designations protect existing fabric and features with various consequences for energy-related modifications. Listing is intended to protect the 'special interest' and 'character' of buildings, through the application for planning consent in relation to any changes that bear upon this.¹⁷ Assessments are necessarily context specific, but preclude a range of internal and external energy efficiency measures deemed to adversely affect the character and performance of these buildings, for example presenting visually intrusive or materially destructive micro-renewables and the use of replacement double glazing in some cases. Conservation areas are subject to special controls that aim to protect the character of a specific streetscape or locale, normally bearing on external interventions and with a generally greater emphasis on aesthetic considerations.¹⁸ Interpretation of the implications of these designations are likewise context-specific but routinely bear on the external appearance and visual impact of energy efficiency measures including the replacement of windows and solid wall insulation.

In practice, the relationship between policy and outcome is far from straightforward or deterministic.¹⁹ This is partly because the application of general policy to specific buildings and contexts requires interpretation and is rarely clear cut. Even from the perspective of the conservation officers who make decisions on interventions to historically designated properties, this can often be difficult to determine. A conservation officer from a Local Authority in the Cotswolds explains the dilemmas: 'It is constant philosophical debates as to what would be appropriate, [and] what wouldn't'. The principles of decision-making remain the same, but the question of how these are applied is always specific. 'It's a matter of going back to what makes this building significant in the first place'. Sometimes this is obvious, but often it is not. Within planning departments, this application of policy is further complicated by a structural tension between legislation relating to the protection of the historic environment, and building regulations promoting energy conservation. Rachel,²⁰ a planner in the same local authority highlights how outcomes are achieved through negotiation: 'The conservation officer says no, but we have to weigh that objection in relation to other factors, such as economic and environmental benefit'. General guidance is often, in practice, contradictory and how to resolve this is often unclear. Differences also exist between different local authorities, in recognition that legislation must be adapted to local economic



Figure 2. The relationship between energy efficiency and building conservation is central to routine interactions between home owners and building professionals. Source: Photograph by Author.

circumstances. In, a Local Authority in the North of England with a significantly less buoyant economy than the Cotswolds, requests to install solar-PV on roofs of 'listed' public buildings and churches arise less from environmental considerations than from the pragmatic need to reduce energy bills. Although 'visually intrusive', the conservation officer concedes with some reservation that standards are often relaxed to allow for these: 'we can't be seen as blocking development'.

Planners' decisions carry legal weight, but other actors play important roles in determining the degree and kind of modification that are made (Figure 2). In buildings that are not historically designated, there is little formal protection and correspondingly greater scope for intervention. While all work must conform to relevant planning regulations, it can exceed legal standards on energy and building conservation. The decision to renovate is itself discretionary. As local authority planning departments are increasingly stretched, enforcement is difficult. In practice, renovation involves a complex set of negotiations, framed but never entirely determined by this legislative context.

Negotiating Authenticity

Ideas about the past of buildings affect whether, and if so how, adaptations are made. For the range of actors involved, concepts of authenticity relate to assessments of appropriate and inappropriate change. In various ways, terms including 'character' and 'personality' are used to describe buildings, encapsulating the idea these have an essence that is important and valuable. For many owners of old buildings, this anchors a sense of ethical responsibility to the building, that can exist in tension with other more pragmatic considerations, including cost. As part of a complex range of factors that inform decisions about renovation, ideas about character therefore mediate understandings of the degree and kind of change that is acceptable, including in relation to decisions about whether and how to adopt energy-efficient and 'green' building technologies. Ideas of material and aesthetic continuity are central to these negotiations. These are related in different and sometimes contradictory temporal understandings of the relationship between the past, present and future of building.²¹

Conservation officers stress the complexity of these assessments, and the degree to which they are relative both to the kinds of building involved and to the kinds of modification entailed. The Stroud Industrial Heritage Conservation Area Design Guide outlines how assessments of character inform whether and how energy-related retrofit is acceptable: while double glazing can improve energy efficiency, replacements can be 'extremely damaging to character': uPVC, in particular is 'visually intrusive', with a 'starkness' that 'deadens variety and interest'. Even though wood is more 'in keeping', double glazing has a negative visual impact on character to the extent it makes it hard to replicate the proportions and glazing details of traditional single-pane construction methods. Likewise the acceptability of micro-renewable emerges relative to the kind and degree of character. Photovoltaics, for example, can have a 'striking visual impact' where used sensitively in industrial buildings 'in locally distinctive and character enhancing ways'. By contrast, the more 'organic' qualities of vernacular design mean these, 'are unlikely to be appropriate in traditional buildings'.

Negotiations between conservation officers, planners, architects and home-owners frequently reveal contested understandings of the respective importance of fabric and appearance as elements of 'character'. Rachel, a conservation officer, describes how her own concern to protect original fabric routinely conflicts with assessments of home-owners, builders and even other planners:

'If they perceive that the window is going to, inverted commas, 'look the same', then they don't think that's going to harm the character, but actually it's the historic fabric and the pattern of it ... It comes back down to this lack of appreciation of the historic fabric and all the rest of it, and they say 'yes, it's going to look exactly the same', but actually that's not got the historic fabric in it, and yes it will look different, you will see the spaces, you will see the double panes, you will see the potentially slightly thicker glazing bars and all the rest of it.

Conservation professionals' perspectives are configured by a role in which the buildings' conservation is paramount and by forms of expertise that relate to particular ideas about how that is to be achieved. Even as recent definitions of historic significance have acknowledged the range of ways in which it is socially attributed, an emphasis on the retention of original fabric and appearance remains central to heritage professional's judgments about the (in)appropriateness of intervention, including those relating to energy-efficiency.²²

For home owners, as for building professionals involved in these processes, the logic of conservation figures more or less centrally as one concern amongst others. Home owners may be more concerned to reduce building and energy costs, just as builders may be inclined to adopt standard working methods and cheaper materials regardless of context. Even so, shared ideas about the value of old buildings orient different understandings of how to remain 'truthful' to them.²³

Visual appearance and the preservation of original fabric also play a significant role in the assessments that home-owners make, albeit informed by different ways of understanding the value of a building's past. Jo lives in a Georgian house, and bemoans the difficulty and expense of heating it. Despite this, she would not consider replacing the 'leaky' single-glazed windows: 'It's certainly about the aesthetic, but it's also about the history, the sense of its oldness and connection with the house I suppose.' Though she confesses to know little of the building's specific history, windows are afforded significance via a more diffuse sense of 'pastness' and as a valued contribution to a 'character' she professes to 'love'.²⁴

Modifications are more readily embraced by home owners, where the contribution to character is understood to be positive. Energy-related adaptations can be seen as

enhancements to 'character', informed by understandings that change is the very essence of what a building is. Jane owns a Victorian house. Though ambivalent about the visual impact of uPVC windows and solar PV roof panels, she recognises the environmental need for greater energy efficiency, and is keen to make whatever changes she can:

You try and maintain some sort of level of integrity within an historic older house but you're always going to come up against conflict between the fabric of the building and the time that you live in. I would hope that a good use of technology would be to try and make the older buildings increasingly more energy efficient without detriment to the aesthetics. Old houses aren't museums; they need to change and adapt to the times.

Energy 'improvements' can be seen as contributing to the character of buildings, as an extension of the logic that buildings gain their character through a process of incremental adaptation and change.

Mark, a builder, highlights the paradox that building conservation is itself a peculiarly modern concern: 'In the past they weren't concerned about conservation, they just did what they thought was right'. As a builder, he admires good craftsmanship where he sees it, but is also aware that old buildings were often badly constructed for people who lived differently than today. Aiming to do 'what is right', he sees this as a way of 'staying true' to a longer history of intervention and change.²⁵ Tom, an architect, is critical of the approach of conservation professionals for similar reasons: 'At no other point in history have people wanted to stop time in that way'. In a range of ways, home owners, builders and architects profess to interests in the past that relate more to continuity and connection than to historic significance as formally defined in conservation planning terms.²⁶

As distinct from this understanding in which change is a form of continuity, improvements in energy performance are sometimes positively connected to the enhancement of character through the logic of restoration. If the character of a building is understood as an embodiment of a specific period of time, then authenticity can be reconstructed through the re-incorporation of materials and components understood to be more truthful to this 'original' period. John and Clare bought and renovated a Georgian grade two listed mill. Nick describes their decision to replace the windows:

They're probably '40s or '50s. That's not what the windows would have looked like originally. And you can get now double glazed replica more, sort of, in fitting with the building than we've actually got in. That would make it more energy efficient. Now, is that damaging the building having those single panes in? Not really.

From their perspective, energy efficiency was compatible with building conservation to the extent that replacement double-glazed windows would more authentically restore the building's 'original' Georgian appearance.

Ideas about the 'character' of old buildings effect decisions about how to adapt them, but also affect how people adapt their behaviour to them.²⁷ Adoption of energy-efficient building technologies is not only about aesthetic and material considerations, but also relates to the less tangible ways these can be understood to change the 'feel' of a building. Tom explains a decision to leave the original windows of the unlisted traditionally constructed mill-workers cottage he owns, even as the rest of the house was comprehensively renovated:

We don't aspire to be sealed. We resist being sealed in, that doesn't appeal at all. It's because I like the smell of fresh air. I think that's probably what it comes down to, and I like the feel of being in a warm bed, and feeling a breeze.

Miles, an architect expresses similar sentiments, which he relates to a reluctance to specify certain forms of 'eco' technology: 'Maybe it's something to do with the idea of us feeling the elements a little bit or letting the elements in and out of the building. I don't think we naturally like to be totally hermetically sealed inside houses'. Aside from the visual and material qualities of Victorian windows, resistance to replacement stems, in this instance, from a more ineffable sense that the 'character' of old buildings, in a positive sense, is to be cooler and more drafty.

Existing in relation to a linked set of regulations, industry standards, testing regimes and technological specifications that have re-defined what people now take to be 'normal' levels of thermal comfort,²⁸ old buildings can be seen as 'cold', 'uncomfortable' and 'inefficient'. One leading double-glazing manufacturer claims their 'beautiful sliding sash windows have been designed to preserve the historic charm of your property without retaining any of the typical problems such as drafts, rattles and jams'. For some home owners, these eco-modernist views inform an understanding that new technologies represent the path to a future in which old buildings are more efficient, greener, and cheaper to run. Authenticity, from this perspective, is primarily a matter of aesthetics. For others, a more romantic sensibility informs a set of ideas about the virtues of old buildings as representatives of older, less energy-intensive ways of life. Reflecting on energy consumption before and after renovation of a nineteenth-century cottage, Trevor notes that improved thermal performance did not result in lower energy use: 'We lived in it and we accepted it because we knew the character of the house meant these things, and so maybe you did put a blanket, or probably a curtain, over one of the doors'. Old houses are not only shaped by, but also shape the people who live in them.²⁹ Increased efficiency is not straightforwardly associated with reduced consumption, if the effect of modification is to change the 'character' and therefore the expectation of how that house is used and inhabited.

Re-imagining the Past

Discussions of climate change and the historic environment have predominantly focused more on issues of adaptation (how to mitigate the threat posed by changing climate?) only latterly giving more consideration to questions of mitigation (how to adapt the historic environment to be more sustainable?). Missing from both these perspectives have been considerations of how the meanings and values attached to the historic environment are themselves transformed by widespread concerns about climate change.³⁰ My research highlights how environmental concerns transform the meaning and value of old buildings in a range of ways.

As public discourses of energy use are increasingly linked to discourses of environmental destruction, old buildings are seen in newly problematic terms as 'drafty', 'leaky' and 'inefficient'. This conception is promoted by manufacturers of building products, and builders themselves, who may seek to gain economic advantage by heightening the sense of the economic and ecological problem to which their services and products respond.

However, environmental concerns and considerations of energy efficiency are also associated with a more positive orientation to old buildings. Ideas about the value of old buildings are heightened by the sense they are threatened, including by changes promoted by concerns with energy efficiency. Jane describes her sadness at what is being lost:

I walk through a place and I look at the windows and scowl. I do imagine a sad scenario where everything has totally and utterly changed. In Leeds, there are all these incredibly grand Victorian terraces all around, when I first went to Leeds I'd never seen anything like that. It was all one era and really cohesive and interesting. Now it's all just PVC and it looks dreary.

The sense of threat heightens understanding of the value of what may be lost.

Ideas about the environmental credentials of old buildings relate to scepticism towards the environmental claims of manufacturers of 'eco' products and materials. Richard, an architect explains ambivalence to the economic interests that drive innovations in the building industry, even as he is aware of his own complicity in this system:

I think I'm in danger of being very sceptical about environmental arguments because really the life cycle kind of cost of whatever environment plug-on isn't really factored in. I mean it's almost impossible to argue either way, but a UPVC window for example, yes it's going to save you energy year on year, maybe replacing a single glazed window with a double glazed UPVC, but actually the old wooden window has been there for ages and its energy, its carbon footprint if you like, has been spent.

These critiques of eco-modernisation have their counterpart in narratives that stress the environmental credentials of old buildings. Richard explains, as he highlights the problems of mass-construction techniques: 'There's a lot of lessons that could be learned from history, from older buildings, just in terms of orientation and solar gains and that kind of thing.' Likewise, home-owners echo conservation professionals in stressing the positive environmental credentials of old buildings as forms of 'recycling'.

Although these discourses echo nineteenth-century romantic thinkers in their concern to connect ecological and building conservation, they are specific responses to a more contemporary sense of impending ecological crisis. As possibility but also as problem, the meaning of old buildings is made newly explicit and newly relevant in relation to these current concerns.

Conclusions

Recent work points to a gap between government policy on energy and buildings and the pace and direction in which energy-related modifications are taking place.³¹ Complex assessments of the value of a buildings' past represent a significant element of how and whether such changes are accommodated, but to date these, considerations have been given little attention. Rather than treating energy efficiency as a 'problem' for building conservation or building conservation as a 'problem' for energy, I have sought to show how different value systems are brought into various kinds of relationship through decisions about whether and how to retrofit old buildings. The findings of an ethnographic study of this nature cannot be readily generalised to other contexts. Even so, they exemplify a more generally significant point about the need to understand how considerations of authenticity and historic value intersect with those of energy efficiency in a range of context specific ways.

Research presented in this paper suggests that the uptake of energy-efficient technologies is significantly determined by assessments of 'appropriateness' that involve various intersecting considerations about the significance of a building's past. Understandings of aesthetic, material and historic continuity are afforded different importance in different contexts and by different people, framing distinct understandings of the degree and kind of change that is consistent with maintaining 'character' and 'authenticity'. These

considerations are particularly important in decisions relating to the installation of windows and micro-renewables, that are often regarded as visually intrusive and which can be materially disruptive. Assessments of character are central considerations in relation to proposed modifications to formally designated historic buildings, but also inform decision-making in a range of other contexts where homes are attributed value as embodiments of the past. Assessments of 'character' are not, per se, inimical to adaptation and modification. However, home owners' commitments to valued features of old buildings may help to explain unwillingness to adopt low-carbon technologies, in some instances.

While it is arguable that more could be done to align legislation and guidance relating to energy efficiency and building conservation, I have highlighted how decision-making in this area is characterised by complex, context-specific assessments that can never be adequately captured in policy of a necessarily more general kind. This foregrounds the importance of the kinds of interpretation, informal negotiation and professional judgment that already occur, but also highlights how the achievement of appropriate balance is likely to be further undermined as cuts to Local Authority funding, result in a reduction of staffing and capacity.

Concerns that old buildings are 'inefficient' and 'uncomfortable' are connected to owners' efforts to upgrade these, for both environmental and pragmatic reasons of cost. However, appreciation of the character of old buildings can be associated with tolerance of lower levels of heating and lighting, and with forms of behaviour that adapt to these. Because inhabitants' assessments of the character of buildings are implicated in their use of these spaces, the relationship between increased efficiency and reduced energy consumption is far from straightforward. Technological adaptations of a building may reduce inhabitants' ability or desire to adapt their own behaviour to it. This finding indicates the limitations of energy policies and incentives that aim to reduce consumption through technologies that improve efficiency.³² It also suggests that the 'problem' of energy-inefficiency in traditionally constructed buildings may be over-stated by experimental efforts to assess buildings and technologies independently from how they are used in practice. This does not necessarily lend support to the 'do-nothing' approach, but does underscore the importance of understanding existing practices as the basis for sound intervention.

Notes

1. English Heritage, *Building Regulations and Historic Buildings*; and English Heritage, *Climate Change and the Historic Environment*.
2. BERR, *Energy White Paper*.
3. <http://www.greendealinitiative.co.uk/> [accessed September 22, 2016].
4. English Heritage, *Climate Change and the Historic Environment*.
5. Fouseki and Cassar, "Energy efficiency in Heritage Buildings"
6. Leijonhufvud and Henning, "Rethinking Indoor Climate Control."
7. Pracci, "Historic Buildings and Energy Efficiency."
8. See e.g. Gampfer, "Retention of Historic Casement Windows."
9. See e.g. note 7 above.
10. STBA, *Responsible Retrofit*; and Fouseki and Cassar, "Energy Efficiency in Heritage Buildings."
11. See STBA, *Responsible Retrofit* for an overview; the STBA's online 'Retrofit Wheel' highlights a range of negative un-intended consequences notably problems of damp and condensation caused by technical incompatibility of materials.
12. Hodson and Marvin, "Making Low-carbon England and Wales."

13. See note 6 above.
14. Judson and Iyer-Raniga, *Reinterpreting the Value of Built Heritage*.
15. Lawrence-Zuniga, *Protecting Suburban America*.
16. See Historic England, "Energy Efficiency and Historic Buildings."
17. Historic England, "Energy Improvements to Older Homes."
18. Ibid.
19. Pendlebury et al., "Conservation Values."
20. In line with established conventions of ethnographic writing I use names to identify quotes. Individuals and organisations have been anonymized and pseudonyms used throughout to protect the identity of individual participants and organisations.
21. Jones and Yarrow, "Crafting Authenticity."
22. See note 19 above.
23. Samuel, *Theatres of Memory*.
24. Holtorf, *From stonehenge to Las Vegas*.
25. See note 21 above.
26. cf. Brumann, *Tradition, Democracy and the Townscape*.
27. Royston, "Dragon-breath and Snow-melt."
28. Shove, "Converging Conventions."
29. Brand, *How Buildings Learn*.
30. See note 19 above.
31. See note 12 above.
32. See note 5 above.

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Notes on Contributor

Thomas Yarrow is a social anthropologist who uses ethnographic methods to investigate the production and circulation of expert knowledge. Most recently, his work has focused on these issues in relation to building and conservation professionals.

Bibliography

- BERR (Department for Business, Enterprise and Regulatory Reform) *Energy White Paper: Meeting the Energy Challenge*. London: HMSO, 2007. Accessed September 22, 2016. http://webarchive.nationalarchives.gov.uk/20100512172052/http://www.decc.gov.uk/en/content/cms/publications/white_paper_07/white_paper_07.aspx
- Brand, S. *How Buildings Learn: What happens after they're Built*. New York: Penguin, 1994.
- Brumann, C. *Tradition, Democracy and the Townscape of Kyoto: Claiming a Right to the Past*. Abingdon: Routledge, 2012.
- English Heritage. *Building Regulations and Historic Buildings: Balancing the Needs for Energy Conservation with those of Building Conservation: An Interim Guidance Note on the Application of Part L*. 2002. Accessed September 22, 2016. <https://historicengland.org.uk/images-books/publications/building-regulations-and-historic-buildings-balancing-the-needs/>
- English Heritage. *Climate Change and the Historic Environment*. 2008. Accessed September 22, 2016. <https://historicengland.org.uk/images-books/publications/climate-change-and-the-historic-environment/>
- Fouseki, K., and M. Cassar. "Editorial: Energy Efficiency in Heritage Buildings: Future Challenges and Research Needs." *The Historic Environment* 5, no. 2 (2015): 95–100.
- Gampfer, S. "New Strategies for the Retention of Historic Casement Windows in Bavaria." *The Historic Environment: Policy & Practice* 3, no. 1 (2012): 3–27.
- Historic England. *Consents and Regulations for Energy Improvements to Older Homes*. 2016. Accessed September 2016, from <https://historicengland.org.uk/advice/your-home/saving-energy/consent-regulations/>
- Historic England. *Energy Efficiency and Historic Buildings – Application of Part L of the Building Regulations to Historic and Traditionally Constructed Buildings*. 2011. Accessed September 22, 2016. <https://historicengland.org.uk/images-books/publications/energy-efficiency-historic-buildings-ptl/>
- Hodson, M., and S. Marvin "Making Low-carbon England and Wales." *Town and Country Planning* 79, no. 9 (2010), 388–392.
- Holtorf, C. *From Stonehenge to Las Vegas: Archaeology as Popular Culture*. Oxford: Altamira Press, 2005.
- Jones, S., and T. Yarrow. "Crafting Authenticity: An Ethnography of Heritage Conservation." *Journal of Material Culture* 18, no. 1 (2013): 3–26.
- Judson, P., and U. Iyer-Raniga. *Reinterpreting the Value of Built Heritage for Sustainable Development*. Barcelos: Green Lines Institute Sustainable Development, 2010.
- Lawrence-Zuniga, D. *Protecting Suburban America: Gentrification, Advocacy and the Historic Imaginary*. London: Bloomsbury, 2016.
- Leijonhufvud, G., and A. Henning. "Rethinking Indoor Climate Control in Historic Buildings: The Importance of Negotiated Priorities and Discursive Hegemony at a Swedish Museum." *Energy Research & Social Science* 4 (2014): 117–123.
- Pendlebury, J., N. Hamza, and A. Sharr. "Conservation Values, Conservation-Planning and Climate Change." *The Planning Review* 50, no. 3 (2014): 43–54.
- Pracci, V. "Historic Buildings and Energy Efficiency." *Historic Environment: Policy and Practice* 5, no. 2 (2015): 210–225.
- Royston, S. "Dragon-breath and Snow-melt: Know-how, Experience and Heat Flows in the Home." *Energy Research and Social Science* 2 (2014): 148–158.
- Samuel, R. *Theatres of Memory*. London: Verso, 1994.
- Shove, E. "Converging Conventions of Comfort, Cleanness and Convenience." *Journal of Consumer Policy* 26 (2003): 395–418.
- STBA (Sustainable Traditional Buildings Alliance), ed. *Responsible Retrofit of Traditional Buildings: A Report on Existing Research and Guidance with Recommendations*. 2012. Accessed September 22, 2016. <https://www.spab.org.uk/downloads/STBA%20RESPONSIBLE-RETROFIT.pdf>