

New sounds created new sensory experiences and interpretations of sensibility; they produced new economies of listening and brought about the comparative valuation of expert versus street spheres of knowledge. They also put into question what was ‘natural’ about sound and its perception. And all is situated in the context of an empire extending its global reach and influencing, as well as being subject to the influences of, soundings far and near. This collection would be interesting for readers across several disciplines dealing with sound and the historical period. The chapters are generally well written and accessible to a broad readership, and they would be useful for the university classroom as well as for those working across the various disciplines engaged.

MARLENE L. EBERHART
CEGEP Vanier College

ANNIE TINDLEY and ANDREW WODEHOUSE, *Design, Technology and Communication in the British Empire, 1830–1914*. London and New York: Palgrave Macmillan, 2016. Pp. 131. ISBN 978-1-1375-9797-7. £37.99 (hardcover).
doi:10.1017/S0007087418000651

This is a short book about engineering in the British world throughout the long nineteenth century. The ‘British world’ refers not only to imperial territories, but also to the interconnections with nations that contributed to Britain’s engineering industries while remaining external to empire. The aim of the Palgrave Pivot series in which it is published is to offer an alternative form of publication for authors whose argument cannot be condensed into a journal article, but does not require or lend itself to expansion as a traditional monograph. This format is well chosen for these authors, the one a historian and the other a lecturer in design. The idea for the organization of their materials is pithy, breaking down sets of historical activity according to four ‘stages of design’ – identification, specification, conceptualization and production – each of which is afforded its own chapter. If they had chosen to expand this range of categories to include more of the abstract terms in which design theorists understand their industry, with the aim of producing a full monograph, the exercise would probably have lost its sparkle. As it is, these categories provide a helpfully fine-grained way in which to appreciate select aspects of engineering method and business practice. I do, however, think that the book would have benefited from at least one more chapter, to clarify the historiographical role of design thinking, for reasons which I address below.

Historiographically this work is positioned amidst literature on industrialization, empire and the history of economics. The cases that these authors explore, which include steam-powered ploughs in Egypt, sugar processing plants in the Caribbean and mechanized sheep-shearing in Australia, amongst other things, are all of direct interest to historians currently investigating colonial economics and administration, interconnections of technology and the environment, and agricultural industrialization. An emphasis on communication also makes this a handy volume for those pursuing the circulation of knowledge within and beyond empire, though I should admit that the role the authors see for design as a ‘conduit for communication’ (p. 3) was never clear to me. The claim is a very crucial one for the authors, who use this phrase repeatedly and pointedly. For myself, that the pursuit of design created many demands for communication is straightforward, as is the idea that communication requires material things, and that joint ventures produce a community of communicators, but ‘conduit’ always seemed to suggest something more.

Such a short book has limited space for scene setting, and so they rely heavily on citations to more expansive works to provide historical background and trajectory. Three in particular are worth highlighting: Adas’s *Machines as the Measure of Men: Science, Technology and Ideologies of Western Dominance* (1989), Cain and Hopkins’s *British Imperialism: Innovation and Expansion, 1688–1914* (1993), and Magee and Thompson’s *Empire and Globalisation: Networks of People, Goods and Capital in the British World, c.1850–1914* (2010). In order to

see exactly how the volume under consideration functions, one would have had to review these three in addition, in order to explain how the collection works as a whole.

Once inside these broader historiographical settings, Tindley and Wodehouse bring their own primary sources into the picture, making innovative and extensive use of the papers of engineering firms held in archives up and down Great Britain. Design here is the stuff of the heterogeneous engineer, and thanks to this 'designers'-eye view', we can clearly appreciate how much communication was required to create an opportunity for engineering work, for determining design and specifications, and also the need for constant feedback between imperial centre and colonial place of delivery, particularly when it came to finalizing and embedding new technologies. Tindley and Wodehouse are motivated by a desire to show how difficult it could be to be a British colonial designer, and the point is well taken. The extent to which machinery had to be designed and redesigned in order to incorporate local knowledge and environmental contingencies is particularly important. However, an unfortunate effect of privileging this perspective is, of course, that we are also encouraged to sympathize primarily with engineers and only their 'designs'. The latter word's ability to work as a dystopian euphemism is mentioned at the start of the book, but that colonial projects were only ever for particular kinds of engineer and administrator is not really dealt with sufficiently. It mainly arises through recognition that the users of technology occupied a very different social position than did the customers paying for new technologies, and that users were typically the last to be accommodated by design, 'accommodation' still often leaving the user's life at risk. All this talk of users, customers and designers has left us with a somewhat flattened social landscape, where all the action comes from more or less equal competitors trying to deliver on their projects. These worries relate to why the book needed another chapter.

Something that Tindley and Wodehouse make very clear is that the professionalization of engineering at this time, the expansion of markets and the creation of new ones for engineering labour, the spread of engineering education and standardization in draftsmanship, the making of new designs and communicating them, as well as definitions of economic 'improvement' and 'good' design, all emerged within and as extensions of empire. But we cannot therefore straightforwardly use the lens of design to analyse the imperial past if design is itself a product of the imperial past. We need an additional chapter that reflexively analyses the assumptions and traditions of design itself, descendent as it is from the work of nineteenth-century engineers, and as it has changed over time. There are plenty of scholars in history of science and technology, or science and technology studies, who are dedicated to unearthing the assumptions embedded in engineering epistemology and interrogating what design is and who it is for. Incorporating further reflexivity in this respect would have helped steer us towards a more symmetric view of the knowledges held by British and non-British experts, and attuned us better to how design strategies are only possible and achievable within particular power relations. By no means are Tindley and Wodehouse ignorant of the importance of power – they emphasize throughout that the principal actors here are elites – so I can only speculate as to why they did not incorporate such a discussion. At the start of the book the authors begin by admitting that design in the sense they are using it is an anachronism, a word 'entirely unused, or barely so' (p. 3) throughout the nineteenth century. By design, then, they really mean those things that engineers were doing, some of which we would now more specifically identify as design, and which would be present in any 'innovation cycle' (p. 6), be it in the imperial past or the present. They perhaps are, then, of the belief that design analysis has different and distinct origins from engineering, that innovation is an effectively timeless phenomenon, and so these categories can be applied unproblematically. But I am just speculating.

The need to look at design's historiographical role reflexively matters both for the author's own conclusions and for the future direction of historical work. What post-colonial historiography will look like is currently being debated and, in some places, decided. It is useful to see Tindley and Wodehouse exploring that space, something which the authors themselves flag in the book's

conclusion. There they write, ‘Although Britain and its empire has been the geographical locus of the book, it is clear that the empire in and of itself did not influence these processes [of design stages and practices] as much as might be initially assumed’ (p. 110). This is the direction in which they see themselves taking post-colonial history, emphasizing how much business was also conducted with nations outside empire, particularly in Europe. But the making of these four stages to work with relative stability through and across empire – i.e. not only working within its bounds – and their eventual visibility as formal design categories, may very well have been one of empire’s achievements. This would mean that empire remains present wherever the designer plies their trade. By leaving the terms of design outside historical inquiry it inevitably looks as though empire ‘did not influence designers as much as we might have thought’, because we weren’t looking. However, if we recognize design and engineering as products of the very activities explored by this book, then the move to diminish the influence of empire becomes questionable. What does such a move achieve? On the one hand, it pushes us towards a more global history, but on the other, it also shelters the design impulse from association with empire. Who is really interested in helping design escape association with empires past and present?

DOMINIC J. BERRY
London School of Economics

MICHAEL BOULTER, *Bloomsbury Scientists: Science and Art in the Wake of Darwin*. London: UCL Press, 2017. Pp. xxii + 175. ISBN 978-1-7873-5005-2. £35.00 (paperback).
 doi:10.1017/S0007087418000663

The funerals of Charles Darwin and Karl Marx, in 1882 and 1883 respectively, attended by the biologist Ray Lankester, open Michael Boulter’s *Bloomsbury Scientists: Science and Art in the Wake of Darwin*, an account of what some call a scientific, artistic and cultural ‘modernity’. The work discusses the emergence of the life sciences and biology, and their rapid divergence and specialization into the disciplines of genetics and ecology. Bringing to light the budding community of science practitioners, notably Arthur Tansley, Olive Schreiner, Marie Stopes and Julian Huxley, it assesses the latter in relation to the science-infused output of turn-of-the-century writers and artists from H.G. Wells to Samuel Butler and Virginia Woolf, and Roger Fry, Gwen Raverat and Wyndham Lewis.

Centred on London’s Bloomsbury, the study delineates the overlapping social spheres, sociopolitical concerns and imaginaries of the science practitioners and popularizers, artists and writers active around the secular University College London (UCL) from the 1880s to the 1930s. Boulter also traces a wider historical geography of London science and knowledge-making sites, including South Kensington. The work takes its readers beyond the capital to assess the London-based practitioners in relation to their Cambridge and Oxford counterparts, but draws perhaps too rigid a distinction between London and these caricatured provincial centres of learning. Additionally, the energy and innovations of the northern, Scottish and other regional powerhouses of learning are omitted from this study.

Existential discussions of nature and nurture, and definitions of what it was to be human, or male or female, that took place in Bloomsbury laboratories, flats and squares, are vividly rendered. Against this backdrop we view, read and hear works of art, novels and poems such as D.H. Lawrence’s ‘Relativity’ (1929):

I like relativity and quantum theories
 Because I don’t understand them
 And they make me feel as if space shifted about like a swan that
 Can’t settle,
 Refusing to sit still and be measured;
 And as if the atom were an impulsive thing
 Always changing its mind.