

<b>Institution:</b> Aberystwyth University		
<b>Unit of Assessment:</b> 28: History		
<b>Title of case study:</b> Scientific Futures: History Informing Tomorrow's World		
<b>Period when the underpinning research was undertaken:</b> 2015–2019		
<b>Details of staff conducting the underpinning research from the submitting unit:</b>		
<b>Name(s):</b>	<b>Role(s) (e.g. job title):</b>	<b>Period(s) employed by submitting HEI:</b>
Professor Iwan Morus	Personal Chair	1 August 2011–present
<b>Period when the claimed impact occurred:</b> 2015–2020		
<b>Is this case study continued from a case study submitted in 2014?</b> No		
<b>1. Summary of the impact</b> (indicative maximum 100 words)		
<p>Morus worked with key beneficiaries to explore the ways in which narratives about the future were made in different historical settings. His research has succeeded in fostering public awareness of how futures past were constructed and, by doing so, has informed current discussions about new technological futures. His work has had an impact on museum and exhibition strategies, on television and radio programming, and on public understanding.</p>		
<b>2. Underpinning research</b> (indicative maximum 500 words)		
<p>Morus has been carrying out research around the history of the future since 2012. A significant proportion of this research was conducted as part of the AHRC-funded project <i>Unsettling Scientific Stories</i>, which ran from October 2015 to December 2018 [3.5]. The project focused on the long twentieth century between the publication of Sebastian di Ferranti's design for the Deptford Power Station in 1887 and the publication in 2007 of the International Panel on Climate Change's 4<sup>th</sup> Assessment Report (which accepted the reality of anthropogenic climate change). The Aberystwyth strand of the research focused on the Victorian and Edwardian periods, and represented a continuation of Morus's longstanding research interest in scientific spectacle and its contribution to imagining the future in the past. Work on this material has continued beyond the end of the project.</p> <p>His research has examined the ways in which narratives about the future, both factual and fictional, were constructed and circulated in the context of Victorian and Edwardian technological culture [3.1, 3.2, 3.3]. It has utilised a wide range of material, including popular magazines and newspapers, scientific and technical journals, autobiographies and archival material and works of fiction for this purpose. The research has focused on key figures (such as William Robert Grove [3.4], Sebastian di Ferranti [3.3], Nikola Tesla [3.1], George Griffiths and H. G. Wells [3.2]), new technologies both real (like the wireless telegraph) and imagined (like the telectroscope), and material contexts such as exhibitions and popular magazines [3.2].</p> <p>It is clear that evoking imagined futures was a key aspect of late Victorian and Edwardian technological cultures. In many ways, the future as it is now understood was a product of this culture. Imagining futures in which new technologies would find a place was central to the business of invention. Crucially, many of the assumptions still made about the ways in which futures might be generated – and by whom – have their origins during this period, and it is this observation that is key to many of the project's engagement and impact activities. Making sense of the Victorian future matters for the ways we see our futures now. We still imagine the future according to a Victorian rule-book, and this has important consequences for the ways in which we deal with many contemporary concerns.</p>		
<b>3. References to the research</b> (indicative maximum of six references)		
<b>3.1</b> Iwan Rhys Morus, <i>Nikola Tesla and the Electrical Future</i> (Icon Books, 2019)		

**3.2** Iwan Rhys Morus, 'Looking into the Future: The Telectroscope that Wasn't There', *Osiris*, vol. 34, no. 1 (2019). DOI: [10.1086/704066](https://doi.org/10.1086/704066)

**3.3** Iwan Rhys Morus, 'No Mere Dream: Material Culture and Electrical Imagination in late Victorian Britain', *Centaurus*, vol. 57, no. 3 (2015). DOI: [10.1111/1600-0498.12093](https://doi.org/10.1111/1600-0498.12093)

**3.4** Iwan Rhys Morus, *William Robert Grove: Victorian Gentleman of Science* (University of Wales Press, 2017) [Submitted to REF2]

#### **Research grants**

**3.5** 2015–2018, AHRC Standard Research Grant, *Unsettling Scientific Stories: Expertise, Narrative and Future Histories*, GBP 598,742 (Co-investigator)

#### **4. Details of the impact** (indicative maximum 750 words)

The research enhanced public understanding and reflection on how futures past were constructed, and, by so doing, informed current discussions about new technological futures. Within this general perspective, the impact of the research has been threefold:

##### ***In enhancing the quality of museum and gallery exhibitions***

Morus acted as consultant for the internationally significant *Electricity: The Spark of Life* touring exhibition organised by the Science and Industry Museum, Manchester (part of the Science Museum Group) in collaboration with Wellcome Collection, London and the Teylers Museum, Haarlem, Netherlands (between 2017 and 2019). The exhibition was shown in London, Manchester and Haarlem and attracted over 350,000 visitors. The Science Museum Group noted that Morus's contribution to the development of the exhibition had been '*influential*' and that he had '*directly informed the exhibition content*'.

*'[His] involvement... informed conversations and opened up different avenues for exploration in developing the narrative for the first exhibition venue ... His research into Ferranti encouraged the curators to include objects from the Science Museum Group collection in the exhibition at Wellcome Collection. This narrative was expanded in the exhibition when it was displayed at the Science and Industry Museum in Manchester.... As internationally significant organisations, it was important to the three exhibition partners that Electricity: The Spark of Life reflected significant current academic research, particularly that carried out by Iwan Rhys Morus'* [5.1].

The Wellcome Collection also attest to the significance of Morus's contribution, noting how his '*work into the spectacle of electricity in the Edwardian and Victorian period was highly influential in the manifestation of the exhibition*' [5.2]. Reviews featured in the national press, including *The Telegraph* and *The Guardian* [5.3].

##### ***In generating new ways of thinking that influence TV and radio programming***

Morus was invited to contribute to a range of media productions on TV and radio. Especially significant was his contribution to BBC4's popular series *Victorian Sensations* (May 2019), Radio 4's *Great Lives* (January 2018) and S4C's *Dibendraw* (May 2015) in which he provided new frameworks for understanding past futures. The Producer of *Dibendraw* (a Welsh-language series aimed at discussing current scientific challenges with reference to historical achievements) described Morus's contribution to the success of the series as '*invaluable*' and noted how his expertise had been '*crucial in influencing and shaping ... content*'. Indeed, the first series was commissioned as a result of a pilot filmed with Morus. '*His ideas and views often inform the narrative of my programming, allowing me to explore new ways of showcasing the reconstructions and spectacles of the past*' [5.4]. Similarly, the Executive Producer of BBC4's popular *Victorian Sensations*, a series examining late-Victorian technology, also noted how Morus's research '*had a decisive impact on the series proposal*'. He noted how discussions with

Morus allowed for a more focused narrative for the series and *'it was this revised treatment that was commissioned by BBC FOUR.... I put the director of the first programme in touch with Iwan. They consulted further, and Iwan's book Nikola Tesla and the Electrical Future was used as part of the research'*. Crucially, he remarked how Morus's *'involvement was decisive in getting the series commissioned'* [5.5]. The series was again made available on iPlayer in January 2021.

#### ***In informing public understanding / shaping public awareness***

Morus has also engaged with broader audiences through public talks, shows and media. Adopting the fictional persona of Professor Marmaduke Salt of the Royal Panopticon of Practical Science, Morus has performed his Victorian Scientific Futures show at a number of venues, including at the British Science Festival (September 2013), the National Eisteddfod (August 2017), the York Festival of Ideas (June 2018), the Aberystwyth Steampunk Spectacular (October 2017 and 2018), and at the National Trust's Llanerchaeron estate (August 2019). The show recreates a Victorian scientific lecture with spectacular experiments with the aim of both introducing new audiences to Victorian views of their own future (and our present) and develop public awareness about the ways in which we think of our own futures today. The Aberystwyth Steampunk Spectacular noted how Morus had:

*'delighted audiences with his lectures as Professor Marmaduke Salt. The Professor, suitably dressed for the occasions brings a range of exciting demonstrations to the attending public on the latest Victorian discoveries.... The event proved so successful that attendance numbers doubled in the second year of the event, with numbers attending from across the UK'* [5.6].

Feedback from the National Trust event also evidence Morus's impact on the visitor experience:

*'Professor Marmaduke Salt's performance ... truly captured the spirit and excitement of scientific discovery in the nineteenth century. Visitors were treated to an engaging lecture on how electricity jump-started a new industry, creating a lasting fascination with novel inventions, remedies and a new electrified way of life. One of the highlights was the use of an original Victorian electric shock therapy machine which gave participants quite a thrill!... It is one thing for visitors to read information, but actually seeing inventions working and having the science behind them elucidated by an energetic speaker helped to fire the imaginations of our visitors and brought the whole fascinating period in history alive'* [5.7].

Morus has also delivered public lectures on aspects of the history of the future and its relevance to contemporary debates about pressing cultural and technological concerns such as AI and the climate emergency. He has lectured at the Hay Festival (May 2017), the National Eisteddfod (August 2017), the Waterfront Museum Swansea (October 2018), and TEDx Aberystwyth (November 2018). His talks bring to life key historical figures. Recent collaboration with the Wales Hydrogen Trade Association for example introduced new audiences to 'the Father of the fuel cell', William Robert Grove, and Wales's role in the emerging hydrogen economy. The organisation's co-ordinator noted how Morus's work had:

*'inspired the Wales Hydrogen Trade Association to hire an actor to play the role of Grove at our launch in February 2020. This was well received by an audience drawn from industry, government and academia; many of whom would otherwise know little or nothing about Grove. The ... Association will continue to look to Iwan as the pre-eminent source of information on Grove to inspire our own emerging story'* [5.8].

Morus's research has also reached further audiences through print media. He has published widely in popular publications such as *Aeon* (December 2014, August 2016, March 2018) and *The Conversation* (October 2017, July 2018, October 2018) [5.9]. His essays for *The Conversation* have garnered a total readership in excess of 170,000 (to date). The number of reads for the most recent essay far exceeded the average for the UK and the article was shared

938 times on Facebook. His October 2017 essay was re-published by several websites, including by the World Economic Forum [5.10]. His *Aeon* posts (combined) have been shared 3,555 times on Facebook.

**5. Sources to corroborate the impact** (indicative maximum of 10 references)

- 5.1** Letter of corroboration from the Group Head of Collections Services, Science Museum Group, 4 September 2020
- 5.2** Letter of corroboration from the Head of Public Programmes, Wellcome Collection, 4 November 2020
- 5.3** *The Telegraph*, 22 February 2017 (<https://www.telegraph.co.uk/art/what-to-see/nerdy-show-will-appeal-gi-fanselectricity-spark-life-wellcome/>); *The Guardian*, 7 February 2017 (<https://www.theguardian.com/science/2017/feb/07/exhibition-electricity-allure-centuries-innovators-wellcome-collection-london-spark-of-life>)
- 5.4** Letter of corroboration from the Producer, *Dibendraw* (S4C), 1 September 2020
- 5.5** Letter of corroboration from Executive Producer, *Victorian Sensations* (BBC4), 2 September 2020
- 5.6** Letter of corroboration from the Aberystwyth Steampunk Spectacular, January 2021
- 5.7** Letter of corroboration from the Collections and House Manager, Carmarthenshire and Ceredigion portfolio, National Trust, 3 February 2021
- 5.8** Email from the co-ordinator of the Wales Hydrogen Trade Association, 5 October 2020
- 5.9** 'Future Perfect', *Aeon*, 10 December 2014 (<https://aeon.co/essays/how-the-victorians-invented-the-future-for-us>); 'Bodies Electric', *Aeon*, 8 August 2016 (<https://aeon.co/essays/the-victorians-bequeathed-us-their-idea-of-an-electric-future>); 'Fuelling the Future', *Aeon*, 27 March 2018 (<https://aeon.co/essays/how-science-fiction-feeds-the-fuel-solutions-of-the-future>); 'How a Victorian lawyer from Wales invented the hydrogen fuel cell', *The Conversation*, 27 October 2017 (<https://theconversation.com/how-a-victorian-lawyer-from-wales-invented-the-hydrogen-fuel-cell-84711>); 'Thomas Edison: visionary, genius or fraud', *The Conversation*, 12 July 2018 (<https://theconversation.com/thomas-edison-visionary-genius-or-fraud-99229>); 'Frankenstein: the real experiments that inspired the fictional science', *The Conversation*, 26 October 2018 (<https://theconversation.com/frankenstein-the-real-experiments-that-inspired-the-fictional-science-105076>)
- 5.10** See <https://www.weforum.org/agenda/2017/10/how-a-victorian-lawyer-from-wales-invented-the-hydrogen-fuel-cell>