

Institution: University of Sussex		
Unit of Assessment: 28 – History		
Title of case study: Seeing Kew anew: collaborating with the Royal Botanic Gardens, Kew, and with the BBC to challenge 'plant blindness' in the UK		
Period when the underpinning research was undertaken: 1 Oct 2006 – 31 Dec 2020		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s):	Role(s) (e.g. job title):	Period(s) employed by submitting HEI:
Jim Endersby	Professor of the History of Science	2006 – present
Period when the claimed impact occurred: 1 Aug 2013 – 31 Dec 2020		
Is this case study continued from a case study submitted in 2014? N		
1. Summary of the impact		
<p>Endersby's research on the history of botany has radically transformed Kew's understanding of its own history, enabling it to better communicate its nature and purpose to 1.35 million visitors a year. His research into Kew's scientific role has had a direct impact on display strategies and on the training of Kew's volunteer guides, and the exhibition he curated in 2017 attracted 29,000 visitors. His research has also benefitted the BBC, who worked with Endersby and Kew on a landmark 25-part BBC Radio 4 science series called <i>Plants: from Roots to Riches</i>. This reached 2.6 million listeners and increased public understanding of both Kew and plant history.</p>		
2. Underpinning research		
<p>Overcoming 'plant blindness' (public indifference to, or ignorance of, the vital role of plants in life on earth) is essential to mitigating the current climate emergency. Kew's mission is to explain why plants and fungi matter, and to show how they can be harnessed to solve 'some of the most critical challenges facing humanity today'. Endersby's work has helped in two ways: by showing how, and why, botanical science was practised in specific historical moments and contexts; and by analysing flows of knowledge between the scientific community and diverse publics over time.</p> <p>Prior to Endersby's research, historians tended to view Kew and its celebrated Victorian director, Joseph Hooker, as aspects of the History of Ideas. Given his long and intellectually important friendship with Charles Darwin, Hooker had largely been considered in relation to Darwinism and familiar topics such as the relationship between science and religion. Endersby's intervention was to focus on scientific practice; on the work that a nineteenth century scientist actually did. This led him to reassess Hooker's career, Kew's historic role, and Victorian science more broadly.</p> <p>Endersby's research argued that the quotidian practices of science – such as collecting, travelling and corresponding – were prior to theorising (the aspect of Victorian science that has received most attention in the past). They came first both literally – plants had to be collected, pressed, named and classified before they could be theorised about – and because they helped determine the kinds of theories that could (or could not) be developed around the evidence. By exploring Hooker's practices, Endersby was able to show how Kew operated in the 19th century, how it acquired its collections and, crucially, how it operated within the British Empire, providing vital context for its emerging Decolonising Kew Strategy. His findings were published as a prizewinning monograph in 2008 – <i>Imperial Nature: Joseph Hooker and the Practices of Victorian Science</i> [R1]. The reach of the research has continued to grow. One of Endersby's 2019-20 Gresham Public Lectures addressed 'The Role of Kew and Colonial Botanic Gardens.' The series as a whole attracted nearly 8,000 views on YouTube.</p> <p>A further strand of Endersby's work has addressed the popularisation of science in the past. He has explored the movement of scientific ideas within society and examined the various media that were used to communicate science to lay people. Rather than identifying a one-way flow of ideas from the scientific community to 'the public', he uncovered a more dynamic process</p>		

whereby different publics appropriated and modified scientific ideas, and scientists themselves adapted to the perceptions and expectations of the public [R2]. In so doing he demonstrated the fluidity of the boundaries between makers, interpreters and publics in scientific knowledge, and showed how the contributions of popular interpreters such as novelists could inspire new scientific discovery [R3]. He argued that a public culture around biology was as important to the history of science as what happened in botanic gardens or their laboratories [R4], suggesting the ongoing importance of public cultures of science.

Endersby has also published research that embodies some of the processes that he has studied, particularly the process of popularising science and engaging with a public scientific culture. His 2007 book, *A Guinea Pig's History of Biology* presented a history of modern biology through the stories of the plants and animals that made it possible [R5]. It has since appeared in three additional editions: a US paperback, a Spanish edition and a German-language edition; a Chinese edition is in press. The German edition coincided with an exhibition based on the book at the State Museum of Upper Austria, in Linz (2012-13). Enderby's 2016 book – *Orchid: a Cultural History* – was also written for a general audience and was published by the Royal Botanic Gardens Kew, as well as by University of Chicago Press [R6]. The book examined the literary, cinematic and cultural meanings of orchids alongside their scientific significance, and this included their status as a sensitive barometer of climate change.

3. References to the research

- R1:** Jim Endersby, *Imperial Nature: Joseph Hooker and the Practices of Victorian Science*, Chicago: University of Chicago Press, 2008, pp. 400. Hardback edition reprinted within a year of publication; paperback edition published in 2012. Shortlisted for the History of Science Society's Suzanne J. Levinson Prize and awarded the Stafleu medal by the International Association for Plant Taxonomy in 2011. [Available on request]
- R2:** Jim Endersby, 'Mutant Utopias: Evening Primroses and Imagined Futures in Early Twentieth-Century America', *Isis*, 104(3), 2013: 471-503. <https://doi.org/10.1086/673270>
- R3:** Jim Endersby, 'Deceived by Orchids: Sex, Science, Fiction and Darwin', *The British Journal for the History of Science*, 49(2), 2016: 205-229. <https://doi.org/10.1017/s0007087416000352>
- R4:** Jim Endersby, 'A visit to Biotope: Genre, Genetics and Gardening in the Early Twentieth Century', *The British Journal for the History of Science*, 51(3), 2018: 423-455. <https://doi.org/10.1017/S000708741800047X>
- R5:** Jim Endersby, *A Guinea Pig's History of Biology*, London: William Heinemann, 2007, pp. 544. Winner of the Royal Society of Literature Jerwood Prize and longlisted for the *Guardian* First Book Award. [Available on request]
- R6:** Jim Endersby, *Orchid: A Cultural History*, Chicago: University of Chicago Press, 2016, pp. 288. See also Kew Publishing. Winner of the 2018 History of Science Society Watson Davis and Helen Miles Davis Prize for books in the history of science directed to a wide public audience. [Submitted to REF2]

Grants

Jim Endersby (PI), 'Mutants, Midwives and Moths: the Public Culture of Anglo-American Biology, 1900-1939', British Academy Mid-Career Fellowship, 01/17-12/17, £103,454.

4. Details of the impact

At the heart of this case study lies the problem of getting people to notice plants. Up to now, most efforts to overcome 'plant blindness' have focussed on science education, or on collaborations between scientists and artists. They usually address the public's understanding of science (or the lack of it) by emphasising such factors as the role of plants in the carbon cycle, or as the basis of the food chain. In contrast, the collaboration between Endersby and Kew has shown that botanic gardens are, and have long been, vital sites for acquiring a better understanding of the role of plants in life on earth.

Kew Gardens provides one of the most famous of these sites in the world but neither its historic or current scientific role have always been visible or well understood. Nor has it been easy to communicate its vital environmental work to the 1.35 million visitors it attracts per year. Endersby's research on the history of Kew, and in particular on its most famous director Joseph Hooker, has offered new ways to address this problem. It has helped Kew to explain the importance of plants to its visitors and, through a partnership with BBC Radio 4, to reach publics beyond those who visit the gardens. According to William Baker, Head of Comparative Plant and Fungal Biology, there are further benefits including 'an inherent cash value to us...because our history is part of our cachet, our USP.' [S1].

Enriching the knowledge base of Kew's staff through new information, co-curation and training

The primary beneficiaries of Endersby's research are staff at Kew, who have acquired new information that has changed how they use and present the collections in their care. Endersby's work has deepened their historical knowledge and enhanced their understanding of the interplay between science and the contexts within which Kew has operated over time. 'Jim's work gave us confidence that Kew's history could be situated in wider histories', explains [text removed for publication] [S2].

This knowledge has enriched professional practice. For scientist Baker, 'understanding the path that the institution took partly explains why I work the way I do... The way Jim has pulled together the story through his meticulous research and his understanding has helped us put our science in its place... I think we can only really understand why we are working the way we are, what we are doing right, what we need to do better and what we are doing wrong as well, by understanding our past.' [S1]. [text removed for publication] Library, Art and Archives, observes that Endersby has 'knowledge and expertise that very few people at Kew have... He was able to bring things to attention... that we wouldn't see otherwise.' [S3]. Archivist [text removed for publication] was advised to read *Imperial Nature* upon her appointment at Kew.

The benefits to Kew are particularly evident in the 'Joseph Hooker: Putting Plants in their Place' exhibition which ran from 25 March – 17 September 2017 and reached 29,000 paying visitors [S4]. This was nearly double the number that attended a previous Hooker Exhibition in 2011. The exhibition mirrored the approach of *Imperial Nature* to explain how Hooker acquired, classified and analysed plants from across the world in pursuit of botanical science. It was structured around themes from the book such as travelling, collecting and seeing. As archivist [text removed for publication] explains, 'he really did design the structure of it as well as picking most of the content and he wrote most of the labels so I would consider him the curator.' [S5]. 'I wouldn't have had that overview of knowledge' stated [text removed for publication], explaining that as well as writing the text panels and suggesting accompanying Kew content, he identified materials in other UK and New Zealand collections that would help tell the story [S6].

The exhibition was a key part of Kew's strategy to introduce the public to its vital scientific work in combatting 'plant blindness'. It represented Kew as much more than a pleasure garden and emphasised its long-standing scientific mission. For [text removed for publication], Joseph Hooker was 'the perfect person to illustrate that point historically...We would not have had the expertise to do that alone, and Jim's work has been invaluable.' [S5]. The problem of seeing Kew as predominantly a public park first arose in the nineteenth century, when the expanding rail network brought the public there in large numbers. Endersby showed staff how writing this tension into their history might help the public understand its dual role today. The exhibition used contemporary cartoons of protests to illustrate the clash between the public – who wanted a relaxing day out – and the garden's director, Hooker, as he tried to establish Kew's scientific status. Drawing on Endersby's research, it illustrated and dramatized the difficulties of getting the public to understand the scientific importance of plants in the past, and made explicit links – through the information panels – to current research, highlighting continuing connections and much-needed future work. Understanding the importance of Kew's scientific work in the past helped staff build a narrative about its work in the present [S6].

Endersby's research on the everyday practice of science provided the exhibition with new interpretations and facilitated a re-imagining of the significance of Kew's vast collections of

plants, books, drawings, letters and artefacts. His research showed that even the most apparently mundane object could be vital evidence of how botany was practised and enabled compelling links to be made between Kew's history and its ongoing work. Lynn Parker, the acting Curator of Illustrations and Artefacts, observed that because of Endersby's involvement, 'the interpretation is really much higher than we have experienced before.' [S7]. On Endersby's advice, the illustrations included in the exhibition were presented as scientific documents rather than as paintings to be admired.

Beyond the exhibition itself, Endersby's research has had a lasting effect on the way Kew's volunteer guides educate their touring visitors. Those who attended his training lecture explained its impact: 'I did several Hooker tours and used Jim's work as one of my important sources. The tours were well received and attracted compliments'; 'his talk was excellent – knowledgeable, interesting and well presented. Very helpful for preparing the tour'; 'I think the tours, exhibition and other Hooker activities at Kew have done a good deal to increase public knowledge about this extraordinary man and his contribution to botanical science'. One guide concluded that Endersby's presentation to staff 'was a key piece of training and enabled me to present a coherent and relevant account.' [S8].

Endersby's work has also informed the development of Kew's new Science and Decolonising strategies to be published in 2021, both of which will place history at their centre. As [text removed for publication] of the Decolonising Kew group, explains 'when you read *Imperial Nature* you completely understand Kew as it is today' and this includes 'the ethical context in which Kew's collections were made.' [S1].

Co-producing new broadcast programming to challenge 'plant blindness' through the history of botany

The 2017 exhibition was the culmination of a longer partnership between Kew and Endersby, underpinned by the latter's understanding of the dynamics of popular science. The collaboration produced other cultural artefacts aimed at alerting the public to the importance of plants and the creation of a public culture around botany. Kew Publishing partnered with Endersby on his *Orchids* book in 2016. A review in *BBC Wildlife Magazine* declared 'Few orchid books are as fascinating as this... this original title reminds us that the destruction of biodiversity also inflicts damage on our shared culture, a fundamental attribute of human existence.' [S9a]. A closely linked Radio 4 programme – *Crafty Orchids* – was broadcast that year and introduced listeners to the history and continuing significance of the plant, including the 3,000 species cultivated at Kew [S9b].

A key aspect of this public-facing co-production strategy was enacted in summer 2014, when Endersby worked with both Kew and the BBC to produce a landmark 25-part Radio 4 science series on *Plants: from Roots to Riches* [S10a]. Endersby was pivotal in brokering the relationship between Kew and the BBC, as the series producer Adrian Washbourne explains: 'The BBC was very keen to promote partnerships with outside organisers and Jim was key to that because of his links with Kew.' [S10b]. For Kew, Endersby acted as 'a critical translator' between it and the BBC [S2]. The series told the story of modern botany from Kew's establishment in 1759 until the present, showing how attitudes towards plants changed 'from tools to exploit for food, fuel and industry, to objects of beauty, to being an essential global resource that must be conserved.' [S10c]. Endersby was the historical consultant for the series. He shaped the narrative and advised on the structure and script as well as appearing in over half of the episodes. Describing Endersby's input as 'completely invaluable', Washbourne explained that 'he is able to apply his ideas from history to the modern day; he is not fazed by modern science... He was able to confront modern day scientific issues through the lens of the historian.' [S10b]. Endersby was also commissioned to write a feature article to accompany the series for the *Financial Times* on 'How botanical gardens helped to establish the British Empire' which the programme makers regarded as 'amazing' and 'exactly what other programmes should be doing.' [S10d&b]. He was thus able to present his reinterpretation of Kew, its history and the broad cultural significance of its work to a much wider audience.

Critical reception attests to the significance of *Roots to Riches* and it was, unusually, made permanently available on BBC Sounds, providing an ongoing legacy. Gillian Reynolds in *The*

Telegraph declared that ‘there’s more to this series than sheep and seeds and why a strain of honeysuckle is called Banksia’ [S10e], while Shaoni Bhattacharya in the *New Scientist* observed that ‘botany flowers magnificently in *Plants: from Roots to Riches*,’ adding ‘if this was intended as botany propaganda then all parties clearly understand their audience.’ [S10f]. The series had considerable reach, attracting an average of 2.6 million listeners a week when it was first broadcast and an additional 562,777 digital requests by September 2014. The BBC’s audience research showed increased understanding of both Kew and plant history: ‘Fascinating - learnt a great deal about Kew’s evolution’; ‘It increased my understanding of plant history very succinctly.’ [S10g].

5. Sources to corroborate the impact

S1: Interview with William Baker, Head of Department of Comparative Plant and Fungal Biology, Kew (2020).

S2: Interview with [text removed for publication] Research Leader, Kew (2020).

S3: Interview with [text removed for publication], Library, Art and Archives, Kew (2017).

S4: ‘Joseph Hooker: Putting Plants in Their Place’ Exhibition.

a. Press release evidencing Endersby’s role as writer and curator

<https://www.kew.org/press-and-media/hooker-putting-plants-place-exhibit>

b. Visitor numbers.

S5: Interview with [text removed for publication] Archivist, Kew (2017).

S6: Interview with [text removed for publication], Galleries and Exhibitions, Kew (2017).

S7: Interview with Lynn Parker, Acting Illustrations Curator, Kew (2017).

S8: Comments from tour guides trained by Endersby (Sherwood Gallery visitors’ book).

S9: *Orchids: a Cultural History*.

a. *BBC Wildlife Magazine* review of *Orchids: a Cultural History*

<https://www.pressreader.com/uk/bbc-wildlife-magazine/20170215/283338996987367>

b. ‘Crafty Orchids’, BBC Radio 4 (01/02/2016)

<https://www.bbc.co.uk/programmes/p03gmnbw/p03g1h6t>

S10: ‘Plants: Roots to Riches’, BBC Radio 4 (July-August 2014).

a. Programme site, <https://www.bbc.co.uk/programmes/b048s3my/episodes/downloads>

b. Interview with Adrian Washbourne, Producer BBC Radio Science Unit (2017).

c. Programme description

<https://www.bbc.co.uk/programmes/articles/32kG092sKkP682c1vBQ3Ljs/radio-4-and-kew-gardens-join-forces-to-explore-the-history-of-plant-science>

d. *Financial Times*, 25 July 2014. <https://www.ft.com/content/dcd33da0-0e69-11e4-a1ae-00144feabdc0>

e. *The Telegraph*, 23 July 2014. <https://www.telegraph.co.uk/culture/tvandradio/tv-and-radio-reviews/10983096/A-whistle-stop-tour-of-the-wonderful-world-of-botany.html>

f. *New Scientist*, 17 September 2014. <https://www.newscientist.com/article/mg22329870-900-a-paeon-to-plants-the-story-of-botany-at-kew-gardens/>

g. Broadcast and digital audience figures and audience research.