

**Centre for World Environmental History**  
**Report on Botany, Climate and Empire Workshop, 19 May 2011**

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**Summary of sessions:**

**Welcome and introduction**

Jim Livesey welcomed the participants. He noted that the expertise in environmental history, global history and the history of empire of many of those present had already lead to several overlapping projects making use of the archives of many of the institutions represented at the meeting (Kew, the BL, the Met office). The goal of the workshop was to shape a research agenda and a theoretical framework involving a reconceptualisation of the interrelation between human and natural history. The records of natural history are a route into this and given their scale, new technologies will be crucial to allowing them the attention they deserve. Collaborative research in this area can provide a bridge between the humanities and sciences.

Vinita Damodaran spoke next. She pointed out that given the current crisis of the humanities, interdisciplinary projects would be crucial in demonstrating their value. She explained the links between the themes of climate, botany and empire, highlighting Richard Grove's illustration of the unprecedented transformation of the natural world that occurred between 1600 and 1960 as the result of economic and territorial expansion. Imperial archives document the ecological reshaping that took place as a result of empire and its development projects. Although many of the wealth of documents from travellers, colonial officials, missionary reports, naturalists and so on have been studied individually, they have not previously been studied as whole for the network of social, scientific, literary and artistic knowledge that they contain. Many of the alarming and pressing problems that face mankind, including famine, food shortages, desertification, pollution, land degradation had precedents in the colonial period. The networks of environmentalists who sought to halt or reverse these problems in the colonial period are the forerunners of today's green and

progressive movements. Botanical gardens were place in which knowledge about the natural world was created and through which information about the natural world circulated on a global scale, not only between metropole and periphery, but across colonial territories. They also acted as social institutions in which environmental awareness was fostered. Vinita outlined CWEH's proposed 'Kew and India' project focusing initially on the correspondence of William and Joseph Hooker and the scoping of the Calcutta botanical garden. Colonial sources like these also have the potential to yield data for comprehensive climate studies.

## **Research questions**

The session was chaired by Richard Follet. Deepak Kumar was unable to be present. Rohan d'Souza was connected by Skype.

Alan Lester noted that the workshop had been organised under the research theme 'global transformations'. Alan then spoke about his own research, focusing on connections between the settler colonies and Britain in the nineteenth century. He spoke of his interest in the way that spatially remote transactions, including settler and humanitarian networks, shape the politics of empire, in particular racial discourse. He discussed the ambivalent nature of many colonial and postcolonial development projects, which were developed in contestation with mainstream discourses, but are nonetheless shaped by their own prejudices and can lead to the flattening or denial of difference. Following individual lives and networks can provide insights into agency, power, policy and practise in colonial spaces and the work that many of the participants are doing involves tracing the personal networks of botanists and climate scientists. Alan described the interdisciplinary aims of the six research themes including 'global transformations' and how this resonates with moves on the part of the research councils towards funding large interdisciplinary bids. The aim is to create an interdisciplinary network of expertise around the themes which goes beyond collaboration on single projects. The support staff include Eleanor Marsh, who was assisting with the day's workshop.

Rob Iliffe introduced his work in the history of science and global history and the international collaborations involved in the digital humanities project such as the Newton Project. He noted that scale was a key challenge for digital humanities projects, along with the development of tools, including for visualisation. He spoke of the potential of crowd sourcing projects for processing large data sets, in the humanities as well as the sciences. This would involve engagement with the non-academic community and dealing with issues of copyright. Sustainability and ownership are crucial and related questions. Open access models are essential in terms of enabling access to information in those countries in Asia and Africa which have traditionally had restricted access. Collaboration between Indian and British partners will be innovative and politically significant and the structure of this collaboration will need working out in the course of the discussions about how to take projects forward. Given that scientists are used to dealing with larger data sets and are typically better funded than the humanities, it will be crucial to learn from techniques currently used in the sciences. In return, the humanities provide scientists with raw data in the form of observations of climate drawn from archival sources such as log books.

Rohan d'Souza envisaged three solutions for moving global history forward. Environmental history must engage with contemporary challenges, including climate change. Research agendas should reflect this. Collaborations with scientists are crucial, but the humanities do not only provide data in the form of new archival materials, the work of historians and social scientists also provides a narrative which is otherwise often lacking in the hard sciences. Finally, we need to think outside national geographies and think about a planetary geography. He noted Richard Grove's work as highlighting linked ecologies transcending national boundaries. Since we are entering an era of

extreme and volatile environment, we have to think of new narratives to discuss and describe them. This necessitates interdisciplinary collaborations and fieldwork. As public interest and concern about climate change continues to grow, environmental historians must speak to wider audiences and media. He re-emphasised that this meant thinking about the narratives about how to explain climate changes and our approaches to it.

Mark Elvin introduced a poem written by a friend of Camerarius in 1694, who established the sexual reproduction of plants. This was a crucial moment as it changed the way people thought about nature. Mark asked whether this was an instance in which Europe did discover a new piece of knowledge or if other societies had similar concepts about the reproduction of plants. Mark then read the poem in translation. He noted that Camerarius was not aware of insects' role in fertilisation and he described the opposition of many to the idea of plant sexuality when Camerarius' work was published.

## **Collections**

Chaired by Jeff Quiley. Julie Harvey was unable to attend.

Chris Mills spoke about some of the problems of collections management at Kew. He noted that the library and archives at Kew include some 300,000 volumes of books, 200,000 works of art and illustrations (making it the largest collection of botanical art in the world), 120,000 pamphlets, and around 7 million manuscripts. Collections relating to India are of particular areas of interest at present. Chris noted that while both the Kew and Natural History Museum had been extensively mined for research into botany, there had been less attention to the other areas in which they provide information. Comparisons of the overlapping collections of Indian drawings held at Kew, the NHM and the British Library have been begun and more work will be done during the summer. Botanical art has begun to attract more attention in recent years, with the opening of the art gallery at Kew.

One of the richest sources of information about India at Kew that has not been mined are the papers of Joseph Dalton Hooker, the second Director of Kew from 1865. Hooker's Himalayan collections include some 7,000 specimens. Hooker developed the scientific work of Kew, including the Jodrell laboratory. The materials relating to Hooker include his drawings, including 300 botanical sketches of plants and scenes from his journey, including the earliest European sketch of Mount Everest. His written records include his journals while in India and correspondence thereafter. There are four series of Hooker records: the first comprising paper and correspondence relating to his expeditions, including 24 notebooks relating to India; the second his correspondence; the third materials relating to his published work; the fourth is a miscellaneous of papers and correspondence relating to his other interests. Other materials relating to Hooker and India are in the Directors' correspondence, which is in the process of being digitised and uploaded to JSTOR as well as Kew's own catalogues. As more materials are uploaded, public engagement will be necessary to make these materials more widely accessible. The herbarium contains 8 million plant specimens altogether. Many of these records have the potential to provide environmental information. Kew is involved in a number of programmes to catalogue, describe and improve access to the archival collections.

Mark Nesbit introduced the economic botany collection at Kew, which he curates. The collection dates from the time of William and Joseph Hooker and reflects the ideas of Victorian scientists about useful knowledge. At the heart of this collection are around 85,000 specimens. The collections also represent human uses of plant materials. The collection is very well documented and is developing links with the archive and library at Kew.

Caroline Cornish spoke about the wood specimens kept in the economic botany collection. She showed six samples of Indian wood. The first was from Hooker's expedition to Sikkim in 1847-51.

It illustrates a period in which ideas about forest conservation were emerging, prompted in a large part by Hooker's own investigations. The sample was named after William Roxborough, an illustration of the layers of information provided by nomenclature. The second piece, of sandalwood, was an 1855 donation from Cleghorn, who was the professor of botany and *materia medica* at Madras medical college and later a key figure in forest conservation in the Presidency. The sample demonstrated the process of inscription that museum objects pass through, bearing labels with information about its scientific and economic value. The third specimen is one of those sent by Thomas Anderson, superintendent of the Calcutta gardens after several trees there were destroyed in the cyclone of 1864. The fourth specimen is from collections prepared for the Paris universal exhibition of 1878. This specimen was labelled with a variety of information including indigenous and scientific names, uses of the wood by local people and colonisers, the region and specific information about the wood and its collection. This specimen was one of those described in Gamble's *Manual of Indian Timber*, 1881. The fifth sample, from the Bo tree, was sent by George Birdwood from the East India Company's museum on its closure in 1879. The last specimen, or ebony, is from Gamble, who was the largest contributor to Kew's wood collections and was sent by him when conservator at Madras. These samples provide an example of the work of the economic botany department at Kew in increasing knowledge about the diversity of wood and its uses in India.

Penny Brook and Antonia Moon spoke about the British Library's collections relating to science and the environment. Penny Brook spoke about the research by Richard Axelby and Savithri Preetha Nair and supported by David Arnold, which resulted in the guide, *Science and the Changing Environment in India 1780–1920: A Guide to Sources in the India Office Records* (2010). The guide was intended as a starting point for further collaborative projects, including digitisation projects. The main British Library collections that have been digitised so far are the log books. Information within the colonial collections includes ethnographical accounts of human interaction with the environment. The Asian language collections also provide important information which provides different perspectives from the colonial materials: Penny showed some examples including an Urdu account of the effects of climate on crop development and a Gujarati poem on the effects of drought. The British Library also holds many botanical drawings, which are described in the online catalogue.

Antonia Moon noted the resources for subject-based studies focusing on science and the environment. The first collection she mentioned are the indices compiled by the East India Company clerks for the British Government's Board of Control under a number of subjects (for example 'indigo'). The second are the Official Publications: a collection of around 70,000 printed materials including those generated by the Indian Government, including departmental reports, surveys and censuses, and works of scholarship. Environmental information gradually became more formalised over the course of the nineteenth century, and this is reflected in the organisation of the archive. Antonia gave the example of the Hyderabad 1941 census as an under-utilised source for environmental information, including information about land distribution, crops and rainfall. The Proceedings are a 46,000-volume series generated with India. These are arranged according to date and location and are thus useful in establishing narratives around particular subjects. The General Correspondence series can fill in gaps in this information, including demonstrating correspondence outside India. Antonia gave some examples of current digitisation projects: including the Wallich project.

Rob Allen provided an overview of the international ACRE initiative, which he leads. The project evolved five or six years ago discussions among scientists in Australia working in the area of agriculture who wanted a more long term model of weather and its effects on the environment, including crops and pastures. The project has now become an international collaboration also involving six key partners from Europe (universities in Germany, Switzerland) and America

(University of Colorado and the National Climate Centre) as well as Australia (Queensland State Government). ACRE has three main aims: to bring together historical weather observations from a variety of sources; to improve the quantity and quality of climate information that is available in databases to use for reconstructions; and to improve access to such data across the board. Rob discussed some of the historical precedents for networks of scientists studying patterns in climate from the eighteenth century onwards. As well as observatories, weather data was kept by organisations including medical institutions, missionary organisations, scholarly societies such as the Asiatic Society, ships, lighthouses, port authorities, and botanical gardens. Rob suggested that ACRE would be interested in collaborating with other workshop participants to study data drawn from botanical gardens and expeditions. ACRE already has key collaborators but the scale and distribution of data on climate means that international multi-disciplinary collaborators will be crucial to developing accurate reconstructions of weather through time. Further efforts are also needed to develop web-based applications able to handle the information from raw data to reconstruction. Rob also described the 'Old Weather' crowd-sourcing pilot project launched by ACRE and the possible applications elsewhere of similar projects to make data openly accessible online.

## **Panels**

The panel sessions were chaired by Pratik Chakrabarti.

Caroline Cornish spoke about her own research at Kew. This seeks to address the question of how museums produce knowledge, and in particular to define the contribution of the Kew Museums to the field of economic botany. Informed by the notion that knowledge is produced and circulated in material forms, she considered in the paper the Museums in terms of their practices. It is the residual traces of these practices held at Kew or in other archives and collections – in the form of collected objects, labels, collections documentation, interpretative devices, correspondence, and publications – as well as contemporaneous textual and graphic records, which have furnished the methodology for this research. This methodology begins with the materiality of particular objects and reconstructs their 'biographies' across time and space, in the process re-connecting objects with archives and making visible nineteenth century networks of knowledge.

Sujit Sivasundaram talked about the interactions between imperial and indigenous systems of knowledge in nineteenth century Ceylon. He talked first about the importance of geography in shaping political realities, with reference to the mountainous situation of the central kingdom of Kandy. He discussed the eighteenth century Buddhist palm leaf chronicle, the *Culavamsa*, which discusses the benefaction of the Kings of Kandy. As part of this, the chronicle discusses the royal endowments bestowed on temples and their gardens. Sujit displayed some temple paintings depicting nature and the conventions that developed around representing nature. Sujit argued that the expression of imperial power was also manifest by the practise of gardening. Sujit then discussed the development of the Peradeniya gardens, which are traditionally said to have been begun by Alexander Moon in 1821-2, but can in fact be traced to an earlier temple garden that had been endowed by the Kandyan kings. Early catalogues for the botanical gardens represent hybrid approaches to gardening: written in English and Sinhala and containing classifications of the plants in both languages. Sujit used these examples to break down the idea of a colonial watershed, demonstrating a far richer flow of information between traditions, including complex interactions between Buddhist, Muslim and Christian ideas about the natural world.

Anna Winterbottom spoke about botanical gardens within the early East India Company settlements. Each of these gardens was established and maintained using a combination of local knowledge and cosmopolitan knowledge networks. Anna mentioned the range of evidence that can be used to reconstruct both of these elements, including dried plant specimens and the information

accompanying them, the correspondence and diaries of those involved with tending and procuring plants for the gardens, and illustrations produced during the process of collecting or cultivating plants. She argued that mapping the relations between these sources – which are often dispersed between different collections and even countries – could allow us to develop a more accurate picture of the botanical experiments and exchanges that took place. Combining scientific and historical approaches to the materials also has the potential to yield valuable information about the local medicinal uses of particular plants and their incorporation into, or exclusion from, global pharmacopeia. The information to be obtained from inter-disciplinary research into these materials also has potential for the study of climate – both in terms of using historical data in studies of climate change and in studying how global networks of exchange in plant materials contributed to alterations in beliefs about the effects of climate on the body.

Simon Pooley spoke about the investigation of bush fires in South Africa. Many Cape botanists traditionally assumed that such fires were responsible for the destruction and desiccation of the environment. As European thought in this period assumed that plant coverage was determined by climatic factors, such as temperature and moisture. Observations of the South African grassy ecosystems lead to the conclusion that these environments had been altered from their natural state by patterns of indigenous land use that were considered destructive. This anti-fire sentiment was echoed across the British Empire. New approaches to the question have modelled the response of the environment to fire in a more precise manner. These show that forest cover in the Cape would have been more extensive in the absence of fire, similarly to fire-dependant ecosystems elsewhere. However, they also demonstrate the natural cycles through which landscapes pass in the long term, including trade-offs between forest and grasslands. Colonial assumptions about the negative effects of indigenous burning techniques have been challenged and it has been shown that some colonial measures to suppress fires had potentially more harmful effects, including the introduction of invasive tree species. A more precise modelling is needed to map the effects of human interventions on the environment in the long term.

Lowell Woodcock spoke about the Anglophone Caribbean between the late 18th and early 20th Centuries. He described the complex relationship between economic and political crises and the establishment of agricultural and botanical research stations in the English speaking Caribbean. The talk covered both the formal and informal links between these institutions, large estates and wider development policies of the colonial governments of the region. The aim was to situate Botanic Gardens and research stations within the succession of economic and political crises that frame this period in West Indian history. Lowell noted in particular that the physical and metaphysical understanding of the region was inextricably bound up with the production of sugar and debate around slavery and abolition. The economic decline of sugar in the period and the consequences of this for the West India meant that botanical and agricultural research projects were often short-lived affairs and that most public funding collapsed during the nineteenth century. Attempts to revive agricultural research in the last years of the nineteenth and the twentieth century were connected with efforts to diversify the economy away from plantation production of sugar towards crops that could be produced by smallholders. There were also some attempts to introduce valuable crops such as cinchona, but most met with little success. Attempts to establish formal research stations were often resisted by the planter oligarchies of the West Indian islands.

George Adamson spoke about his PhD project, which is focused on synthesising climatic information for western India during the era of East India Company dominance: 1780-1857. The nature of the information available allows for reconstructions of climatic conditions using a variety of methodologies, and for analyses of societal responses to climate during the period. The climatic diversity of the region, and sensitivity to global circulation patterns such as ENSO provides a further viability to such a project, as does the current paucity of climatic vulnerability literature within India during the early-colonial period. George described the sources that are available for

reconstructing climate and responses to climate change and environmental destruction in this period. These include the records of colonists and missionaries who were fascinated but also threatened by the climates they encountered. Climate data is included in newspapers, personal diaries and writings. George showed some examples of reconstructions of the timing and intensity of monsoons in western India, which allows an analysis of the variability of the onset of monsoons.

### **Visit to library collections**

Members of the workshop visited Sussex University's Special Collections which were introduced by the archivist Rose Lock. We looked at collections including the correspondence and writings of Leonard and Virginia Woolf and Rudyard Kipling and the papers of Dudley Stamp relating to Burma. Some examples of the Mass Observation Archive and from selected works of travel and botany were also shown.

### **Book launch**

Workshop participants attended the launch of Deepak Kumar, Vinita Damodaran and Rohan D'Souza, *The British empire and the natural world: environmental encounters in South Asia*, Oxford University Press 2011. Jim Livesey, Mark Elvin and other friends and colleagues spoke of the contribution of Richard Grove, to whom the work was dedicated, to the development of the Centre for World Environmental History at Sussex and of the discipline more widely.