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Balancing the interplay between botanic gardens and schools: The work of William Hales and Lilian Clarke

(1) Introduction

Although the generic subject of botanic garden history is increasingly well documented, botanic gardens lack a reflective historical commentary on the educational work of their institutions. Apart from individual garden monographs,¹ and the work of Stafleu (1969), Prest (1981), and Spary (1993), (2000), few authors have examined the socio-educational history of botanic gardens.² Exceptions to this absence are Gilberthorpe's doctoral thesis, which critiqued changes in British botanic gardens in the 1980s, and Kleinman's doctoral study 'The Museum in the Garden', which considered research, display, and education at The Missouri Botanical Garden from 1859.³ Gilberthorpe's research highlighted the silence created by the lack of socio-historical documentation on British botanic gardens and Kleinman's study considered the struggle, 'to balance and integrate' the diverse needs of multiple audiences. These silences and struggles are still salient issues for botanic gardens today. This paper considers the interplay between professionals within botanic gardens and schools. It utilises documentary material, unearthed from school and garden archives, to consider evidence for both the exclusion and encouragement of children in botanic garden histories and the sometimes competing roles of institutional ideology and personal interest. It ends with an examination of how these cultural memories might inform current debates on the socio-educational roles of botanic gardens in the 21st century.

(2) Spaces of exclusion and inclusion in the botanic garden

Much has been written about the changing identities of amateur naturalists in 19th century Europe, and the impact upon them of a burgeoning community of professional academics subscribing to the laboratory based 'new biology'.⁴ During this period of fluctuation the botanic garden was viewed by De Candolle as an 'ideal space within which the general public, non-professional, and professional naturalists could associate freely'.⁵ Botanic gardens occupied this role mainly due to their design as 'living books' and

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¹ See R. Gunther (1912), *Oxford Gardens* (Oxford: Parker and Son); A. Minelli (1995), *The Botanical Garden of Padua 1545–1995* (Venice: Marsilio); S. Minter (2000), *The Apothecaries Garden — a History of Chelsea Physic Garden* (Stroud: Sutton); and P. Mickulas (forthcoming), *Britain's Botanical Empire: The New York Botanical Garden and American Botany, 1888–1929* (New York: New York Botanical Garden Press).

² F. Stafleu, "Botanic gardens before 1818", *Boissera*, 14, 1969, pp. 31–46; J. Prest (1981), *The Garden of Eden: the Botanic Garden and the Re-creation of Paradise* (New York: Yale University Press); E. Spary (1993), *Making the Natural Order: The Paris Jardin du Roi, 1750–1795* (Unpublished Doctoral Thesis, Cambridge University); and E. Spary (2000), *Utopia's Garden: French Natural History from Old Regime to Revolution* (Chicago and London: Chicago University Press).

³ E. Gilberthorpe (1987), *British Botanical Gardens in the 1980's: Changes reflected by bibliographical and social survey* (Unpublished Doctoral Thesis, University of Sheffield); and K Kleinman (1997), *The Museum in the Garden: Research, Display and Education at the Missouri Botanical Garden since 1859* (Unpublished Doctoral Thesis, University of Cincinnati).

⁴ See David Allen, "On parallel lines: natural history and biology from the late Victorian period", *Archives of Natural History*, 28/3, 1998, pp. 361–371; and J Drouin and B Bensaude-Vincent, "Nature for the people", pp. 408–425, in: N. Jardine, J. Secord and E. Spary (eds.) (1996), *Cultures of Natural History* (Cambridge: Cambridge University Press).

⁵ De Candolle, "Jardin de Botanique", 1822, pp. 359–422, reprinted in: F. Cuvier (ed.), *Dictionnaire des Sciences Naturelle*, cited in: J. Drouin and B. Bensaude-Vincent (note 4), p. 419.

their use as public spaces for promenading.⁶ This may have been the case for adults, but in many British botanic gardens of the period children were barely tolerated, often invisible in the public face of gardens and, in some cases, actively discouraged as in the instance of four barefoot boys turned away from the gates of the Royal Botanic Gardens, Edinburgh in 1894.⁷ This discouragement of children was also overtly expressed in the 1854 rules of Cambridge University Botanic Garden, which stated that ‘servants with children and children by themselves are not to be admitted’.⁸ This was by no means an isolated attitude and was reflected in the rules of other botanic gardens of the period.⁹

In this paper I attempt to ‘navigate the spaces of inclusion and exclusion’¹⁰ of work with schools in botanic gardens with particular reference to the activities of botanic garden curator William Hales (1874–1937) and botany teacher Lilian Clarke (1866–1934). In rescuing these vibrant characters from the doldrums of history and situating them in current educational discourse, the place of education in botanic gardens will be asserted. This paper draws on a doctoral study, which utilised archival material from the Chelsea Physic Garden, London UK and other establishments such as associated schools, to inform the discussion and considers how the historiography of botanic gardens might enlighten present day practices.¹¹

(3) Methods: Document analysis

Little socio-historical documentation exists on British botanic gardens, as Gilberthorpe has noted: ‘as institutions in the social, rather than the scientific sense, they have attracted less in print than might be expected.’¹² The range of archival documents used in this research study was extensive and represented both ‘private’ and ‘public’ images of one botanic garden’s educational practices. McCulloch (2004) observes that ‘archival collections can transcend simple and straightforward typologies of ‘public’ and ‘private’, across the landscape of ‘official policy-based documents’, ‘institutional records’ and ‘personal archives’.¹³ ‘Documents’ can also refer equally to visual records such as photographs, even when they are ‘institutionally approved images’.¹⁴

One issue I faced concerned the sourcing of relevant documents, for as Cohen and Manion note, ‘documents in education often consist of unpublished material and are therefore less accessible than reports of empirical studies in professional journals’.¹⁵ Gathering the different types of documents needed for this study involved visiting many archives and sifting through documents which librarians and archivists term ‘grey and fugitive literature’ — that is literature on the margins — such as memorandums, minutes of meetings, seed exchange records, and consequently analysing them in order to find ‘the real conflicts of interest within the social world which they claim to represent’.¹⁶

As I was conducting the research from the perspective of reflective practitioner, that is a botanic garden educator reflecting on the history of the garden’s educational practices, it was important to explore

⁶ J. Lindley (1838), *A Report upon the Present Condition of the Botanical Garden at Kew with Recommendations for its Future Administration* (London: Royal Botanic Garden, Kew), Archive Manuscript; J. Prest, (note 2); and J. Drouin and B. Bensaude-Vincent, (note 4).

⁷ *Evening Dispatch* (Edinburgh), 23 April, 4 May and 5 May 1894.

⁸ C. Preston, Pers. Comm. Cambridge University Botanic Gardens, 1997.

⁹ See for example, Gunther (note 1) on Oxford University Botanic Garden.

¹⁰ E. Ellis and C. Waterton, “Environmental citizenship in the making: the participation of volunteer naturalists in UK biological recording and biodiversity policy”, *Science and Public Policy*, 31, 2004, pp. 95–105 (p. 99).

¹¹ See Dawn Sanders (2004), *Botanic Gardens: Walled, Stranded Arks or Environments For Learning?* (Unpublished Doctoral Thesis, Sussex University).

¹² E Gilberthorpe, *British Botanical Gardens in the 1980’s* (note 3), p. 12.

¹³ G. McCulloch (2004), *Documentary Research in Education, History and the Social Sciences* (London: Routledge Falmer), p. 53.

¹⁴ G. McCulloch and W. Richardson (2000), *Historical Research in Educational Settings* (Buckingham: Open University Press), p. 109.

¹⁵ L. Cohen and L. Manion (1994), *Research Methods in Education* (London and New York: Routledge), p. 51.

¹⁶ J. Codd, “The construction and deconstruction of educational policy documents”, *Journal of Education Policy*, 3/3, 1988, pp. 235–47.

the private individual worlds of educators stored in obscure archives, as well as the more easily accessible garden policy documents, for, as Prentice has argued, too frequently in the history of education ‘we focus on the big event and the struggles for power among the leading actors’.¹⁷ Indeed, previous educators in botanic gardens (often female) and, more broadly, women in natural history education have repeatedly been made invisible. In this paper I highlight a ‘fainter voice’¹⁸ of one woman botanical educator and situate her practice in the context of associations between representatives of scientific establishments and schools.

The greatest challenge in this research study was to become aware of what Weiler (1999) has described as

a recognition of the situated quality of narratives ... demands not only that historians be conscious both of their own assumptions as they gather “evidence”, but also that they consider the context in which such evidence is produced.¹⁹

In unlocking the doors of disparate archives, this study [Sanders (2004)] made it possible to

write people into being, to enter that place where past lives, where ink on parchment can be made to speak.²⁰

However, in evaluating these records, it was important to recognise that the context in which such evidence was produced was one where many, particularly in British botanic gardens in the nineteenth and early twentieth centuries, considered education to occupy a peripheral role. This remains the state of affairs for several gardens throughout the world today.²¹

(4) Case-study: Educational work at Chelsea Physic Garden, London: 1899–1937

Much of the available evidence on botanic garden education for children suggests that in a number of institutions it is difficult to distinguish between practices motivated by individual beliefs, and those that were initiated through institutional policy. A case in point is the work of William Hales, curator at the case-study garden; Chelsea Physic Garden. Hales became curator of the garden in 1899 and held that post until 1937. During his extensive curatorial period, a series of relationships developed between the garden and schools, teachers and other institutions, which indicate a substantial commitment to the encouragement of botanical education with younger learners. By the time Hales left the garden it was, as Minter has described, ‘a garden far from asleep’ and much of the work he encouraged was of an educational nature.²² Yet, very little explicit evidence survives from within the institution of work with school children during this period. Other than occasional entries in the management committee minutes and records of seeds supplied to other institutions, much of the material pertaining to his support for the education of young botanists and gardeners has been found in school archives and the photographic records donated by his descendents to the garden.

Of importance though, for the evidence it offers on the institutional perspective, is the result of a commission by the Garden in 1899, for a special report on educational provision from Professor John Farmer of the Royal College of Science. Pertinent to work with schools, Farmer wrote:

It would be desirable that specimens should be supplied to Colleges, Polytechnics and Schools in so far as the resources of the garden may permit.

¹⁷ Alison Prentice, “Workers, professionals, pilgrims: Tracing Canadian women teachers’ histories”, pp 25–42, in: K. Weiler and S. Middleton (eds.), *Telling women’s lives: Narrative inquiries in the history of women’s education* (Buckingham and Philadelphia: Open University Press), 1999, p. 26.

¹⁸ B. Gates (1998), *Kindred Nature: Victorian and Edwardian Women Embrace the Living World* (London and Chicago: University of Chicago Press), p. 6.

¹⁹ K. Weiler, “Reflections on Writing a History of Women Teachers”, in: K. Weiler and S. Middleton (note 17) p. 47.

²⁰ C. Steedman, “The Space of Memory: in an archive”, *History of the Human Sciences*, 11/4, 1998, pp. 68–9, here p. 68. See also Dawn Sanders (note 11).

²¹ J. Galbraith, “Connecting with Plants: Lessons for Life”, *Curriculum Journal*, 14/2, 2003, pp. 279–86.

²² S Minter (note 1) p. 111 and Dawn Sanders (note 11).

He went on to say:

Some of the schools around London maintain small botanical gardens of their own, and it would be of great advantage to them to be occasionally supplied with such rooted specimens as can from time to time be spared.²³

The report prompted a favourable response from the Trustees of the Garden, in several areas of the Garden's work, including the provision of plant material to schools. Prior to 1899, the only recorded reference that I could find regarding Chelsea Physic Garden and the education of school children is a brief note in Field and Semple's (1878) book *Memoirs of the botanic garden at Chelsea belonging to The Society of The Apothecaries of London*. It states:

1834 — Some other suggestions were made as to the admission of teachers of botany and their classes into the garden, but as these suggestions were not adopted, it is unnecessary to refer to them more particularly.²⁴

Even during William Hales' early career at the Physic Garden, support for work with schools was erratic, as illustrated by this extract from the Minutes of the Management Meeting of June 10th 1915:

A letter was received from Mrs Cuning, asking if the committee would permit a children's open-air class to be held at the garden. Resolved that Mrs Cuning be informed that the committee regret they are unable to accede to her request.²⁵

Unfortunately, there is no record of the reasoning behind this negative response.

(5) Planting bulbs correctly

Visual evidence of Hales' support for education work at the Physic Garden is contained in a photograph, provided by his descendents, of a group of children at the garden from the local primary (elementary school) school waiting to be shown 'how to plant bulbs correctly'. From other documentary and oral history evidence collected from local school logbooks, and letters received from former pupils, it has been demonstrated that gardening with potted bulbs and holding flower shows were widespread practices among schools in the local area. Indeed, further evidence, (leaflets on the cooperative purchase of bulbs by schools from The London School-Gardening Association), has indicated that by the 1920's it was practiced London-wide. Even today, schools in the borough where the Physic Garden is situated, participate in an annual bulb show.

In addition to his work on site and in schools, William Hales became an examiner for the Royal Horticultural Society's Teachers' Examination in '*School and Cottage Gardening*' in the late 1920s. This examination consisted of a three-hour written paper, in which candidates were required to answer six questions and also undertake practical examinations. In the examination paper of March 24th 1928, the compulsory question required candidates to write an essay on one of the following: the care of garden tools, indoor gardening lessons and the educational value of gardening. As an examiner Hales would have needed to take a view on gardening and schools, possibly this extra-mural role influenced his wider professional outlook as a botanic garden curator and his notions of working within educational contexts. A key element of Hales' association with schools was his support of the work of Dr Lilian Clarke and her development of the first botanical garden in a British school.

(6) The work of Lilian Clarke

William Hales became a supporter of the inspirational work of Lilian Clarke, who was botany teacher at James Allen's Girls' school in Dulwich, South London from 1896 to 1926. In her initial year at the school, Clarke started to develop botanical gardens, which became known as '*The Botany Gardens*'. This was the first time that such an experiment was undertaken by a school in the UK. The Botany

²³ J Farmer (1899), "Educational provision at the Chelsea Physic Garden" (Unpublished report; unnumbered pages).

²⁴ H. Field and R. Semple (1878), *Memoirs of the Garden at Chelsea* (England: Gilbert and Rivington), p. 186.

²⁵ "Minutes of the Management Meeting of June 10th 1915", *Chelsea Physic Garden Management Minutes 1915-1974* (London: Chelsea Physic Garden).

Gardens became an outdoor laboratory where subjects such as plant growth and pollination could be observed. Clarke encouraged her pupils to make their own books rather than use textbooks. When the ecology of plants took precedence over knowledge of ‘*the natural orders*’ in examinations, Clarke, supported by the eminent British ecologist Arthur George Tansley, created a new series of beds in her garden to replicate examples of British habitats, such as salt marsh and pebble beach. Hales’ support to Clarke is recorded in her publication, *The Botany Gardens Of The James Allen’s Girls’ School, Dulwich: Their History And Organisation* (1922) published by the London Board of Education. Clarke describes the plants at the edge of the pond:

Forget-Me-Knots, Brooklime, Musk, Water-Mint, Yellow Iris, Water Plantain, Arrowhead, etc. A little farther in are partially submerged plants such as Water Lilies, Floating Pondweed, and totally submerged plants such as Elodea. Some of the pond plants were given by Mr. Hales, Curator of the Chelsea Physic Garden, to whom many thanks are due for valuable help in designing the pond and in other matters.²⁶

Clarke goes on to say that:

The pond has proved a great success and of the utmost value in our lessons.²⁷

Significantly, for contemporary botanical educators, Clarke also stated, in a book published posthumously, that the gardens

have become, in many cases, out-of-door laboratories, and the work indoors and out of doors is one.²⁸

As previously stated, Clarke communicated with more than one representative of the professional botanical community and worked hard to be visible in the wider scientific milieu of her time. At the age of nineteen she was awarded the Society of Apothecaries gold medal for her botanical studies undertaken at Chelsea Physic Garden and completed her BSc. Degree in 1893, after studying botany under Professor F.W. Oliver, at University College London.²⁹ Clarke became a Fellow of the Linnean Society of London, elected in one of the first swathes of women Fellows during the period 1904–1905, following the announcement to admit women and was also active in the British Association for the Advancement of Science.³⁰ In 1917 the degree of Doctor of Science, for a thesis on the botanical education she had developed at James Allen’s Girls’ School, was conferred on Clarke by The University of London.³¹ Yet despite this level of scientific and educational accomplishments Clarke has been paid little attention in print.

By the time William Hales’ period at the Physic Garden ended in 1937, the duties of Curator included:

maintaining the botanical collections of living plants for teaching purposes and, so far as practicable, provide for the supply of botanical specimens for the purposes of external instruction and examination.³²

Interestingly, when Hales became curator in 1899, the Physic Garden management changed from the Society of Apothecaries to the City Parochial Foundation, a Charity that has education as its main remit. This change of management resulted in a reinforcement of the garden’s *general* educational role for the promotion of the study of botany, but with an explicit focus on higher education establishments

²⁶ Lilian Clarke (1922), *The Botany Gardens of James Allen’s Girls’ School, Dulwich: Their History and Organisation* (London: London Board of Education), pp. 23–4.

²⁷ Lilian Clarke, (note 26) p. 24.

²⁸ Lilian Clarke (1935), *Botany as an Experimental Science in Laboratory and Garden* (Oxford: Oxford University Press), p. vii.

²⁹ W. Brenchley, “Dr. Lilian Clarke” (Obituary), *Nature*, 24 March 1934.

³⁰ See *Proceedings of the Linnean Society of London* (London: Linnean Society) 1904–1905.

³¹ E. Fogg, “Lilian J. Clarke” (Obituary), *Proceedings of the Linnean Society* (note 30), October 1933 – May 1934.

³² Extract from *Chelsea Physic Garden Management Minutes 1915–1974* (London: Chelsea Physic Garden), December 1937.

rather than schools in London. Perhaps Hales had a more generous view of the term 'educational role' and embraced that view within his professional role.

(7) The struggle to balance and integrate

It is a testament to William Hales' educational vision that he supported Clarke in her innovative work, but there are many unanswered questions as to why he showed so much interest. I could find no evidence to demonstrate when they first communicated, though as a botany student for the Society of Apothecaries examination, Clarke would have visited the garden often as a young woman. Did she retain contact with the garden after completing her studies? As a botany teacher, did she lobby Hales? Did Hales take a personal interest in school botany work through follow up visits to schools that were supplied with plant material or through his own children's education? Unfortunately, the Physic Garden and James Allen's Girls' School lack records of when these two individuals first met.

Why was there so little evidence in the Chelsea Physic Garden archives of Hales' support for schools? Is it that the garden management committee considered this work peripheral to his primary duties and by inference his professional identity? In the context of this paper it is important to note this absence and consider how symptomatic of attitudes towards curatorial tasks the presence and non-presence of these records might be. This tension between scientific and educational duties is by no means unique to either botanic gardens or past histories. Recent commentaries have documented conflicts between those staff in natural history museums and botanic gardens that produce scientific knowledge and those that represent these bodies of knowledge through exhibitions and educational activities.³³

Indeed, it has been argued that in some institutions we have witnessed a bifurcation of these two communities and that the 'identity and mission of natural history museums will be decided by struggles between these two programmes, rather than the negotiation of a symbiosis'.³⁴ Although, in other commentaries a more coalescent view of museum staff engaged in 'the production of narratives' is voiced.³⁵

Kleinman (1997) has recognised the struggle, 'to balance and integrate the sometimes complementary, sometimes conflicting demands of scientific research, public display and education of graduate students, amateur gardeners, and school children' evident in the history of the Missouri Botanical Garden from 1859, a history reflected in the wider botanic garden community.³⁶ Clearly, curators such as William Hales strove to balance a variety of associations in their work and in doing so reinscribed the botanic garden as a meeting place for professional botanists and educators. His support for Lilian Clarke's work and his commitment to the place of gardening in the school curriculum, through his activities as an examiner for the Royal Horticultural Society, demonstrate how one curator navigated the task of espousing the education of children, indeed Hales' curatorial period is documented by Minter as significant for 'involving children in the activities of the garden'.³⁷ However, due to evidential vacuums in the archival record it cannot be assumed that his espousal of this role was unproblematic nor indeed that his achievements in education were performed without challenge.

Lilian Clarke, through her development of the botany gardens and her innovative view of her students as active participants in the lessons, has left a powerful legacy for both botanic garden educators and classroom teachers. Certainly, the recent focus in Britain on the school garden through government initiatives such as 'Growing Schools' and the work of organisations such as Learning through Landscapes and the Royal Horticultural Society continue Clarke's vision of the garden occupying a central position in the school learning experience.

³³ See for instance L. Roberts (1997), *From Knowledge to Narrative: Educators and the Changing Museum* (Washington: Smithsonian Institution Press); and S Allison-Bunnell, "Making nature 'real' again: Natural history exhibits and public rhetorics of science at the Smithsonian Institute in the early 1960s", in: S. MacDonald (ed.) (1998.), *The Politics of Display* (London and New York: Routledge).

³⁴ S. Allison-Bunnell, (note 33) p. 95.

³⁵ L. Roberts, (note 33) p. 151.

³⁶ K. Kleinman (note 3), unnumbered page. For the wider botanic garden community see, F Stafleu, (note 2); and Dawn Sanders, (note 11).

³⁷ S. Minter (note 1) p. 112.

(8) Clarke and Hales' contributions to contemporary practice

During her teaching career at the James Allen's Girls' School, Lilian Clarke made a valuable contribution to educational practices, contributions that have resonances for educators today. William Hales, in his support of education through his work as garden curator, demonstrated that science and education could be accommodated in the activities of botanic gardens, both within the garden perimeters and beyond. The key elements of the contributions both Clarke and Hales made are:

- ◆ an early use of the 'outdoor classroom', as in Clarke's use of the botany gardens as outdoor laboratories
- ◆ a recognition of the educational role of botanic gardens by Hales in his curatorial activities
- ◆ a multi-faceted view of the role of curator as embodied by Hales
- ◆ a proactive view of learners as authors of their own texts demonstrated by Clarke's encouragement of her students keeping their own records of garden experiments
- ◆ a recognition that learners and teachers contribute to the pace of lessons, as documented in oral histories (Clarke asked her class to 'change the pace of a lesson' [school archives])
- ◆ an early example of a teacher documenting her own teaching practices as recorded in several publications³⁸
- ◆ and an affirmation of the importance of partnerships between diverse institutions such as Chelsea Physic Garden and James Allen's Girls' School.³⁹

(9) Discussion

How might these cultural memories inform current debates on the socio-educational roles of botanic gardens in the 21st century? The distinct lack of a coherent picture of the function and role of botanic gardens could be seen to have an adverse effect on the roles that they occupy in contemporary society. There are currently more than 2000 botanic gardens worldwide and one of the primary challenges for educators in these gardens is to raise the profile of education. In a world where there is prolific species loss and plants are proven to be vital to life on Earth, botanic gardens can ill-afford to ignore the education of children. Yet, there continues to be challenges implicit in the institutional fabric of many botanic gardens.⁴⁰ Revisiting past practice, through the tools and methods of the historian, offers modern practitioners historical evidence that can legitimate the practice of children's education in botanic gardens. Moreover, these historical data, as in the case of Clarke's teaching methods and Hales' embracement of education, as part of his professional identity as a curator, can contribute to contemporary debates on the socio-educational roles of modern natural history institutions, such as botanic gardens and museums, by providing models of professional practice that challenge the modern practitioner to ask; how have botanic garden and museum professionals developed their practice in the last one hundred years?

(10) Conclusion

In revealing the work of Hales and Clarke, a model for associations between professionals working in and with botanical institutions is portrayed. The model offers contemporary curators and educators a more unified notion of education; one that permeates both science and horticulture in the botanic garden. Young people in Western society are often estranged from the process of growing plants and lack knowledge about the landscapes where their food originates.⁴¹ Botanic gardens, predominantly situated

³⁸ See Lilian Clarke, 1922 (note 26); and 1935 (note 28).

³⁹ See S. Minter (note 1) and Dawn Sanders, (note 11).

⁴⁰ J. Foster (1997), "Networking for education", in: D. Touchell, and K. Dixon (eds.) (1997), *Conservation into the 21st Century*. Proceedings of the 4th International Botanic Gardens Conservation Congress, Perth, Western Australia (West Perth, WA: Kings Park and Botanic Garden); J. Galbraith, (note 21); and Dawn Sanders, (note 11).

⁴¹ J. Dillon, M. Rickinson, D. Sanders, K. Teamey and P. Benefield (2003), *Improving the understanding of Food, Farming and Land Management amongst school-age children: A Literature Review (DfES Research Report 422)*; London: DfES).

in urban contexts, can provide unique settings in which young people can reconnect with plants and the resources they provide. In the current socio-environmental climate, rebuilding this link between people and plants is an important educational challenge; one to which botanic gardens and their professional staff are well placed to respond. Historical partnerships, such as that between Hales and Clarke, proffer a blueprint for future practice.

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