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STEPHEN FORBES



Hawke  
Research Institute for  
Sustainable Societies

Hawke Research Institute for Sustainable Societies  
University of South Australia  
St Bernards Road  
Magill  
South Australia 5072  
Australia  
[www.unisa.edu.au/hawkeinstitute](http://www.unisa.edu.au/hawkeinstitute)

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# HOW BOTANIC GARDENS CHANGED THE WORLD

Stephen Forbes\*

## **Cultural institutions and power**

Cultural institutions such as art galleries, museums and botanic gardens are intimately engaged with social values. Highly visible and effective stewardship of collections and recognition and regard for the quality and independence of the scholarship associated with them is the hallmark of cultural institutions. Importantly, these institutions have established public trust, authority and power, based on the significance of both their collections and their scholarship. In combination with policies to facilitate public access, cultural institutions have established an enviable position as the embodiment of public trust.

Trust, authority and power are a remarkable combination that can effect social innovation. The challenge of course is to develop a cogent policy framework to exploit this power, and cultural institutions have little capacity to invest in 'big-P' policy. How many policy wonks have you come across from cultural institutions? Certainly there has been a focus on commodification of products associated with collections for actual and virtual visitors (or, if you like, consumers) and there is significant debate about this. Indeed, commodification has set the scene for an assault on public trust in some institutions.

Botanic gardens have had a particular source of power derived from the economic, environmental, social and cultural values of the plants in their collections. Indeed, botanic gardens have changed the world through their explorations and expositions of plant collections and are implicated in significant social change.

A brief outline of the role of botanic gardens in contributing to social change and innovation would include: first their contribution to medicine, second the way they have profoundly changed the nature of our relationship with the natural world, third as an engine for the appropriation and development of cash crops during the era of colonialism, and fourth as an agent for the commodification of the natural world. Finally, there is the role of botanic gardens today. Botanic gardens can contribute significantly to environmental reconciliation in the twenty-first century. While some valuable exemplars are already realised, there is still a real opportunity to exploit the potential of botanic gardens (and other cultural institutions) further. Perhaps much of this potential remains unrealised.

## **Botanic gardens and medicine**

While nascent botanic gardens can be reasonably identified in, for example, Aztec, Chinese, Egyptian and Arabic cultures, the accepted origins of botanic gardens, at least in the west, began with the medicinal gardens of university medical schools during the sixteenth century. Conventional wisdom considers Pisa, founded around 1544 by Medici decree, and Padua, founded under the Venetian Republic in 1545, as the earliest botanic gardens. Others, including Salerno in Italy and Montpellier in France, probably pre-dated Pisa but are no longer on their original sites. The purpose of these early botanic gardens was to support

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\* Director, Adelaide Botanic Garden

medical teaching in medical schools by establishing a plant collection as both a pharmacy and as a pharmacopeia.

Plant-based medicines are significant—more than half of the world still depends on them for most of their drugs. The investigation of plant-based medicines has profoundly influenced the progress of both physicians and surgeons throughout medical history, regardless of their cultural medical tradition. However, the application of plant-based medicines is significantly limited by challenges in establishing dosages and separating active principles. In this context, the role of botanic gardens in establishing a systematic approach to identifying and applying plant-based medicines in medical schools is important. Indeed, botanic gardens facilitated progress beyond *Dioscorides Materia Medica* from the first century AD and provided a foundation for contemporary pharmacology.

The contribution of botanic gardens to medicine during the Renaissance is the first illustration of how botanic gardens changed the world.

### **Botanic gardens and the relationship with the natural world—plant classification**

While the first botanic gardens were focused on medicinal plants, the Age of Enlightenment provided an environment in which a search for a universal system for the classification of plants and animals could be made. The Age of Enlightenment's pursuit of principles governing nature, man and society provided the context for the emergence and eventual acceptance of the Linnaean system of taxonomy as a universal truth that overcame the bias of cultural systems of taxonomy. The establishment of botanic gardens such as those of Clusius and Linnaeus was principally to explore the diversity of the world's flora and to establish a system of classification.

The Linnaean system of classification was uniquely successful. While subsequent research has modified Linnaeus' system, the fundamental principles, including the adoption of a binomial system of nomenclature and the classification of plants primarily on their reproductive parts, have persisted. Many of Linnaeus' plant names remain in use today.

However, the success of the Linnaean system as a natural system of taxonomy reinforced prejudices against cultural systems of taxonomy beyond those already implicit in European culture. The success of natural systems resulted in a new bias against the acceptance and understanding of cultural taxonomies.

The rejection of cultural taxonomies is more than a historical side show. The invention of a natural system of taxonomy is the first Pandora's box botanic gardens have had a hand in opening. 'The consequences may prove to be a loss of specificity, an ability to talk about the world in only general terms, with fine distinctions and detailed classifications eroded through uniformity.' (Ashmore 2002). This loss of specificity may even have led a cultural devaluation of biodiversity. The relationship between language and the environment is therefore a particularly salient area of investigation, to which linguistics, and specifically the concerns of ecolinguistics, can contribute to the wider issues of environmental crisis (Maffi 2001).

The role of botanic gardens in establishing and promoting a scientific classification system for plants during the Enlightenment is a second instance of how botanic gardens changed the world.

### **Botanic gardens and colonisation—economic botany**

The story of botanic gardens in the service of the empires of the great nations of Europe is a story well told through the history of crops such as rubber and tea, although perhaps Adelaide's Museum of Economic Botany is the most eloquent visible reminder of this era. The last surviving colonial Museum of Economic Botany tells the story of the role of Adelaide's botanic gardens in planting the South Australian colony. The Museum was the government's first significant investment in a theatre to engage colonists in the opportunities to exploit new food, fibre, timber and medicinal plants for their own wealth, the wealth of the

colony and the wealth of Britain. The theatre director, the Garden's second director Richard Schomburgk, is credited as being the father of the grain industry in South Australia.

The establishment of botanic gardens in Sydney, Hobart, Melbourne and Adelaide was as an expression of economic and social rather than scientific and cultural arguments. The establishment of botanic gardens in colonial empires including Ceylon, India (Calcutta), British Guiana, Brazil, South Africa, German East Africa (Amani), Reunion, and Java (Bogor) all reflect colonial economic ambitions for the domestication of indigenous crops or the introduction of new ones. The success of botanic gardens as a nursery for these economic ambitions is patchy, although there are enough examples to justify the investments.

The implication of botanic gardens in the identification, appropriation and development of cash crops during the Age of Empire provides the third illustration of how botanic gardens changed the world.

### **Botanic gardens and botanical exploration**

Botanic gardens, along with zoos and natural history and ethnographic museum collections, offer an authentic experience of the world's natural heritage. The exhibits themselves, rather than the abstractions apparent in medicinal, taxonomic and economic collections, become central to the visitor experience. The role of botanic gardens in sifting the world's flora to present the exquisite, spectacular, bizarre and rare is a powerful one. The link between plant explorers and botanic gardens was particularly powerful in the nineteenth and early twentieth century.

Curators, in selecting plants for display, send a powerful message to visitors about the significance of the plants. Clearly if a botanic garden selects a plant for display, the plant is considered desirable by it. Conversely, if a botanic garden is not displaying a plant that could reasonably be grown in a particular climatic zone, perhaps the plant is seen as less desirable or even undesirable. While such a message might not be intended, the selection of plants for display within a botanic garden assists in commodifying exotic floras and the discounting of indigenous floras. Certainly the homage paid to the Giant Amazon Waterlily by botanic gardens throughout the world has no historical parallel commitment to an exposition of indigenous floras.

The role of botanic gardens in the nineteenth and early twentieth centuries in determining the values of flora has significantly influenced the community's attitude to indigenous floras.

### **Botanic gardens and environmental reconciliation**

Botanic garden assets include the collections, an astonishing diversity of genetic resources, scholarship associated with the curation and study of the collections, and public trust. In contemporary botanic gardens the potential of these assets is still being explored.

Today botanic gardens have a significant and still emerging role in exploring, conserving and exploiting the world's flora to contribute to environmental issues ranging from water conservation and recycling to carbon sequestration and biofuels to species conservation and landscape restoration. However, botanic gardens are challenged by their diverse mandates of recreation, education, culture, conservation and research by the needs of their living collections and their visitors. Further, botanic gardens largely operate as independent institutions. Herbaria (commonly part of botanic gardens) have developed effective national and even international collaboration on a range of significant projects, including regional taxonomic treatments and floras and shared database arrangements.

Within botanic gardens, significant international cooperation is surprisingly rare. The Millennium Seed Bank project led by the Royal Botanic Gardens, Kew aims to secure 10% of the world's flora in seed banks by 2010 and 25% by 2020. This project remains the outstanding example of an international alignment for

botanic gardens and may underwrite a future for botanic gardens aligned to landscape restoration in an age of climate change.

In South Australia, the Botanic Garden of Adelaide has led the establishment of the Sustainable Landscapes project as a partnership with the Mawson Lakes Investment & Economic Opportunities Group that includes LendLease and the University of South Australia, the Land Management Corporation, the Adelaide and Mount Lofty Ranges Natural Resource Management Board and SA Water. The project has leveraged the Garden's intrinsic qualities of trust, authority and power to assist in transforming public and private open space in South Australia. The achievements of the project are exceptional and are an outstanding local exemplar for change achieved under the auspices of a botanic garden. In a national context, the partnership between the Department of Housing and the Royal Botanic Gardens, Sydney to establish gardens in targeted communities is another example of social innovation achieved by leveraging the intrinsic qualities of a botanic garden. In an international context there are of course many other examples from education, conservation and culture.

## Conclusion

As we have seen, cultural institutions are invested with trust, authority and power. Botanic gardens have used this power to change the world through contributions to medicine, the adoption of a universal system for naming plants, economic botany and the commodification of plants.

Botanic gardens are commonly the most visited (and perhaps the most egalitarian) of the cultural institutions in the cities where they are found. The challenge for botanic gardens in the twenty-first century is to develop effective policy to ensure the efficient application of this trust, authority and power. Perhaps investments in social change associated with environmental reconciliation and investments in landscape restoration are the most attractive avenues to explore. Although some investments have been made in these areas, there are still significant opportunities and unrealised potential for botanic gardens to again change the world.

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