

Preliminary Literature Review

The Now and Future Botanic Garden

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Existing botanic gardens often mediate between two functions as living collections of plants (valuable to the scientific community) and pleasurable experiences (valuable to the general public). Within their communities, many botanic gardens have been vital instruments for accumulating and exposing localized knowledge of how plants grow and how humans can manipulate their environments to foster growth (Rakow & Lee 2011). Their physical design emphasizes simple, legible, pleasurable plantings based on styles from across the world (Monem & Craig 2007).

While these gardens have been pleasurable additions to their communities and have performed valuable work curating and managing plant collections, their efforts have not had significant effects in the transformation of landscape understandings. Beloved American myths of the wilderness and frontier continue to be widely accepted in society (Cronon 1995, 88; Marris 2011). These myths inform a mindset which believes that there is no way for human and natural systems to be integrated (Cronon 1995). However, as Cronon points out, the only option which follows from the wilderness mindset is the total elimination of human society (Cronon 1995).

Given that humans have to somehow adjust our mindsets and lifestyles to the context of our one earth, it becomes essential for us to develop an informed understanding of how socio-ecological systems can function. In 1967, McLuhan pointed to “the possibility of arranging the entire human environment as a work of art, as a teaching machine designed to maximize perception and to make everyday learning a process of discovery.” (McLuhan 1967) Unfortunately, we have failed to expand such arrangements to the landscape.

Widespread apathy regarding socio-ecological systems can be attributed to the scale at which humans learn and understand. Gobster, Nassauer, et al. attribute the lack of

understanding to the “human perceptual realm” (Gobster et al. 2007). They posit that, outside of the scale at which we humans interact with our environments, we can understand systems only indirectly. Although we may not understand such systems, our actions still impact them. “Beyond this perceptible realm exists a broader range of environmental phenomena that function from sub-microscopic to global scales and over instantaneous to geological time periods.” (Gobster et al. 2007)

A first step to developing “an honest belonging to knowledge”, as described by urban forester Gustavsson, is found in the garden (Gustavsson 2004). Throughout human history, gardens have served as places where people developed deep and grounded knowledge of the world around them. Research to date has proven that, in Europe, private gardens are playing a strong role in supporting ecosystem functioning (Gaston et al. 2005; Smith et al. 2006; Loram 2008; Goddard et al. 2010) and preserving human ecosystem knowledge (Barthel, Folke, et al 2010). However, as Hitchmough notes, private gardens in the United States are much different from those in Europe, particularly Great Britain (Hitchmough 2008).

In order to change landscape norms, both in private and public situations, it is essential we develop what Gustavsson calls “reference landscapes” where people experience new landscape types. He suggests that these landscapes must “embody greater complexity and stimulate active use and enjoyment.” (Gustavsson 2004, 188) He suggests that many of these reference landscapes be gathered in “landscape laboratories” where landscape issues are explored in physical form and their full impacts tested (Gustavsson et al. 2005). These “landscape laboratories” sound much a better-developed realization of botanic gardens.

Currently, the existing continuum of public spaces ranges from types that focus purely on human needs, such as public parks, to those that focus on science and ecology, such as ecological restoration sites. Botanic gardens fall at the center of this continuum, mediating

between human experience and scientific understanding. Hohn defines a botanic garden as “a permanent institution for the purpose of acquiring, preserving, researching and interpreting to the public for its instruction and enjoyment plants of cultural, scientific, historical, technological and natural history value” (Hohn 2008, 2-3). Hohn cites Richard Lighty’s distinctions which suggest that research-only without a physical realization or publicly accessible display gardens is a botanical institute, while a display garden without intentionally curated collections is a park (Hohn 2008).

If the botanic garden is, as Corner sets forth, an “elaborate organizational fiction”, its form will necessarily reflect the relationship of humans to the natural world (Corner 2013). Applying the idea of botanic gardens as museums (centers of knowledge with living collections) has a strong historical basis. Nuala Johnson traces the origins of the modern botanic garden to the physic gardens of medieval Europe. Physic gardens were intended primarily to support the work of physicians and were, therefore, arranged according to astrological or other scientifically-based ordering schemes (Johnson 2011, 4). However, during the rapid expansion of colonialism in the eighteenth century, physic gardens attached to universities started to fade away in favor of state-sponsored botanic gardens. Rather than being structured around astrological or medically-oriented concepts, these new botanic gardens were based on taxonomic or geographic ordering schemes (Johnson 2011, 6).

Many botanic gardens continue to reflect organizations and planting styles carried over from eighteenth-century gardens. These information-based frameworks are realized through themes based on geography, taxonomy, and cultural narratives (Corner 2013). Within their communities, many botanic gardens have been vital instruments for accumulating and exposing localized knowledge of how plants grow and how humans can manipulate their environments to foster growth (Monem & Craig 2007; Rakow & Lee 2011). However, in many cases, the gardens have had little to show as actual impacts, even at the basic level of curation and plant conservation (Maunder et al. 2001) The

physical realization of these gardens often reflects their histories. Many focus on simple, legible, pleasurable ways of planting based on styles from across the world.

Given that our understanding of the human/world relationship has changed drastically in the past century and will continue to change as we move into the future, it is ironic that the plantings in even recently-designed botanic gardens continues to duplicate past forms. Even Corner's own work at Hengchun Tropical Botanical Gardens in Taiwan, with a topographic organization dictating the design, relies on planting styles typical of botanic gardens from the mid-20th century and earlier (Corner 2013). To make botanic gardens relevant in the 21st century and beyond, we need to move beyond what urban foresters Gustavsson et al. describe as "a culture of headlines and a feeling of a sense of knowledge" to "an honest belonging to knowledge" (Gustavsson et al. 2005, 389). Rather than relying on passive reproduction of past forms, as is evident in even newly-designed parts of contemporary botanic gardens, it is essential that we find new ways to structure and communicate knowledge through experience.

When the overall botanic garden is considered as a museum, each garden area becomes an individual exhibit. According to Barry Lord, "the purpose of a museum exhibition is to *transform* some aspect of the visitor's interests, attitudes, or values *affectively*, due to the visitor's discovery of some level of meaning in the objects on display - a discovery that is stimulated and sustained by the visitor's confidence in the perceived *authenticity* of those objects (Lord 2002)." Applying these key terms to the physical design of botanic garden areas could become a highly generative source for developing new understandings. In order to have full agency as a living museum about the relationships between people and plants, botanic garden plantings must become *transformative*, *affective*, and *authentic*.

Making Planting Design Transformative

Considering the *transformative* aspect of botanic gardens, the experiential aspect of such places can no longer be solely concerned with displays of horticultural virtuosity or pure

beautification. Nor can the style of planting attempt to mask human intervention or create a non-human ecological preservation or recreation. Purely artistic plantings and those designed as recreations of some supposed humanity-free baseline are commonplace within the American consciousness (Nassauer 1995; Ellison 2013). In addition, there is a strong tendency for naturalistic plantings to be mistaken for wild nature, without human intervention (Spirn 1995).

It is ironic that recent innovations in planting design have occurred outside the realm of botanic gardens. Instead, new ways of planting have come from individual practitioners, mostly garden designers and landscape architects, experimenting with new methods for physically designing gardens, mostly on residential properties or urban public spaces (Kingsbury 2004; Kingsbury 2013). If botanical gardens are to remain relevant within the urban landscape, their form must transform to reflect their new roles in the urban milieu.

To find new precedents for creating environmental experiences that construct the relationship between humans and the natural world in accordance with 21st-century dialogue, this study will look to contemporary planting design, especially as exemplified in the work of the Nigel Dunnett and James Hitchmough in the United Kingdom, Oehme van Sweden and Roy Diblick in the United States, Giles Clement in France, and Piet Oudolf in the Netherlands.

In contrast to older understandings which treated planting as either a work of beautification, a pure scientific organization, or an attempt to completely replicate a wild environment, contemporary planting designers have created hybrid methods of planting design. By understanding the narratives conveyed through these hybrid methods, then reconciling the narratives with those of the botanic garden in the 21st century, new methods for creating planting designs in botanic gardens can emerge.

With a founding in ecology and aesthetic perception theory, Dunnett and Hitchmough have

established a concept of “Enhanced Nature”, which blends human aesthetic desires with ecological system functioning (Dunnett & Hitchmough 2004). According to their recent article in *Topos*, Dunnett and Hitchmough exemplified this approach in their design for the London Olympic Park plantings (Hitchmough & Dunnett 2013). Given the requirements of the Biodiversity Action Plan, Hitchmough and Dunnett resisted the notion of simply creating a “pre-development” restoration project (Hitchmough & Dunnett 2013). Instead, they “argued successfully that it was essential that this ecological requirement was combined with a realization that [they] had to create a festival landscape that would be inspiring, uplifting, and highly memorable.” (Hitchmough and Dunnett 2013, 74) Their methods involved working with planting designer Sarah Price to create highly-considered mixes with a combination of “native” and non-native plants.

In a more permanent situation, Piet Oudolf’s planting design for the Lurie Garden in Millennium Park is one of the most widely publicized examples of Oudolf’s signature “mingled” planting style. Its design consisted of a scheme for managing plant communities to create certain effects that balance ecological resilience and human aesthetic desires (Oudolf 2011).

When Roy Diblik was asked to create a planting scheme for the Sullivan Arch Garden, in sight of Oudolf’s Lurie Garden, he decided to create a similarly naturalistic effect. However, he chose to utilize a modular grid system of plant communities that are repeated throughout the space. In addition, Diblik’s plant palette was determined using colors drawn ‘Earthly Paradise’, a Pierre Bonnard painting in the adjacent wing of the Art Institute of Chicago. (Oudolf & Kingsbury 2013)

A few recent plantings at botanic gardens have started to explore the possibility for integrating human and ecological understandings. At the new Native Plant Garden at New York Botanical Garden, the designers have stepped beyond attempts to simply recreate prehistoric ecological systems. In a video for NYBG discussing the opening of the Native

Plant Garden, Sheila O'Brady of Oehme, Van Sweden Associates states that the plantings were specifically designed to be legible so that audiences wouldn't see them as messy or purely wild (New York Botanical Garden 2012). Combined with a postmodern aesthetic expressed in the hardscape elements, this planting acknowledges the need for highly intentional mediation between ecology and art in garden design. However, it is questionable whether or not the choices made are actually legible for general audiences and won't meet the same fate as Olmsted's projects, which are now often mistaken for wild nature (Spirn 1995).

As concentration of knowledge about plants, botanic gardens need to include various reference landscapes at human scale, providing people with actual places where they can come to live with and understand new landscape types. Examining the basis for new developments in planting design and applying them to botanic gardens will enable them to become transformative experiences.

Making Planting Design Affective

For a landscape to be *affective*, it must involve the emotions of the human audiences who experience it. The emotional power of landscapes has been explored through the work of phenomenologists, especially embodied in the idea of affordances - relationships between humans and the things around them. According to Gibson, "The affordance of anything is a specific combination of the properties of its substances and its surfaces taken with reference to an animal" (Gibson 1977, 67). In the case of botanic gardens, the relationships between humans and their environments are the primary affordances. Merleau-Ponty's discussion of perception in *The World of Perception* posits that, rather than an object being "a system of properties which present themselves to our various senses and which are united by an act of intellectual synthesis", an object is instead "a unified entity of which all these various qualities are merely different manifestations" (Merleau-Ponty 1948, 46).

Landscapes are fields of multiple objects, which offer a complexity of affordances. In *The Materiality of Stone*, Tilley defines landscapes as “perceived and embodied sets of relationships between places, a structure of human feeling, emotion, dwelling, movement and practical activity within a geographical region which may or may not possess precise topographic boundaries or limits.” (Tilley 2004, 25) Merleau-Ponty, Pallasmaa, and Tilley emphasize the importance of understand the experience of place through the body, all-at-once, rather than through separate analysis of different sensual characteristics (Merleau-Monty 1948; Tilley 2004; Pallasmaa 2011).

In *Senses and the City*, Diaconu, Heuberger, Mateus-Berr and Vosicky have gathered together a compilation of papers on what they term “urban sensescapescapes”. Diaconu’s work focuses on tactility in the urban environment. Some of the principles she outlines in *Matter, Movement, Memory* include material qualities and textures, vertical stratification, kinaesthetic sensations, and patina (Diaconu 2011c). In *City Walks and Tactile Experience*, she categorizes the tactile and kinaesthetic experience of the city to include haptic qualities of surfaces, dimensions of corporeal depth, overall rhythms, exposure to weather conditions, and physical traces of individual and collective histories (Diaconu 2011a). In contrast to the tactile emphasis of these two pieces, *Mapping Urban Smellscapes* provides an olfactory analysis of Vienna.

Taking the understandings outlined in these and other methods of sensory analysis, it becomes possible to understand how to design botanic garden plantings that evoke deep emotional responses. In addition, Kaplan’s work with environmental preferencing can offer clues for making landscape affordances easily apparent, in addition to sensually memorable (Kaplan 1979).

Making Planting Design Authentic

In the context of botanic gardens, authenticity involves a multi-system, multi-scalar systems approach to understanding. According to Gustavsson and Peterson, “Authenticity might

mean that our interest turns from isolated individual objects to larger sizes, which are perceived mentally as local landscapes or places. The central area has to be large enough to be understandable. Even the way the surroundings are visually and functionally linked in history and today this becomes functionally important” (Gustavsson & Peterson 2003, 328)

Carlson points out that the functionality of landscapes must be highly evident in their design in order for us to appreciate them fully. “When we regard a landscape as unnecessary, we often cannot take it seriously nor appreciate it as right or appropriate, and thus the possibility of our admiring it suffers accordingly” (Carlson 2000, 188). Botanic gardens have the essential function of curating, concentrating, and displaying relationships between people and plants. Their physical design must make those functions clear, not disguise human involvement with naturalistic styles or be perceived as pure art.

Key Terms

Affordances

possibilities that a landscape signals to those who see it

“an affordance refers to what a perceived object or scene has to offer as far as the individual perceiver is concerned” (Kaplan 79)

“an affordance is neither an objective nor a subjective property but both”. (Tilley 2004)

“the assumed mechanism(s) whereby complexity presents itself as (weak) signal(s) to consciousness” (Letiche & Lissak 2009, 62)

Botanic Garden

a repository of knowledge about plants with living collections

“a permanent institution for the purpose of acquiring, preserving, researching and interpreting to the public for its instruction and enjoyment plants of cultural, scientific, historical, technological and natural history value.” (Hohn 2008, 2-3)

Landscape Aesthetic Experience

“a feeling of pleasure attributable to directly perceivable characteristics of spatially and/or temporally arrayed landscape patterns” (Bogster, Nassauer, et al 2007)

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