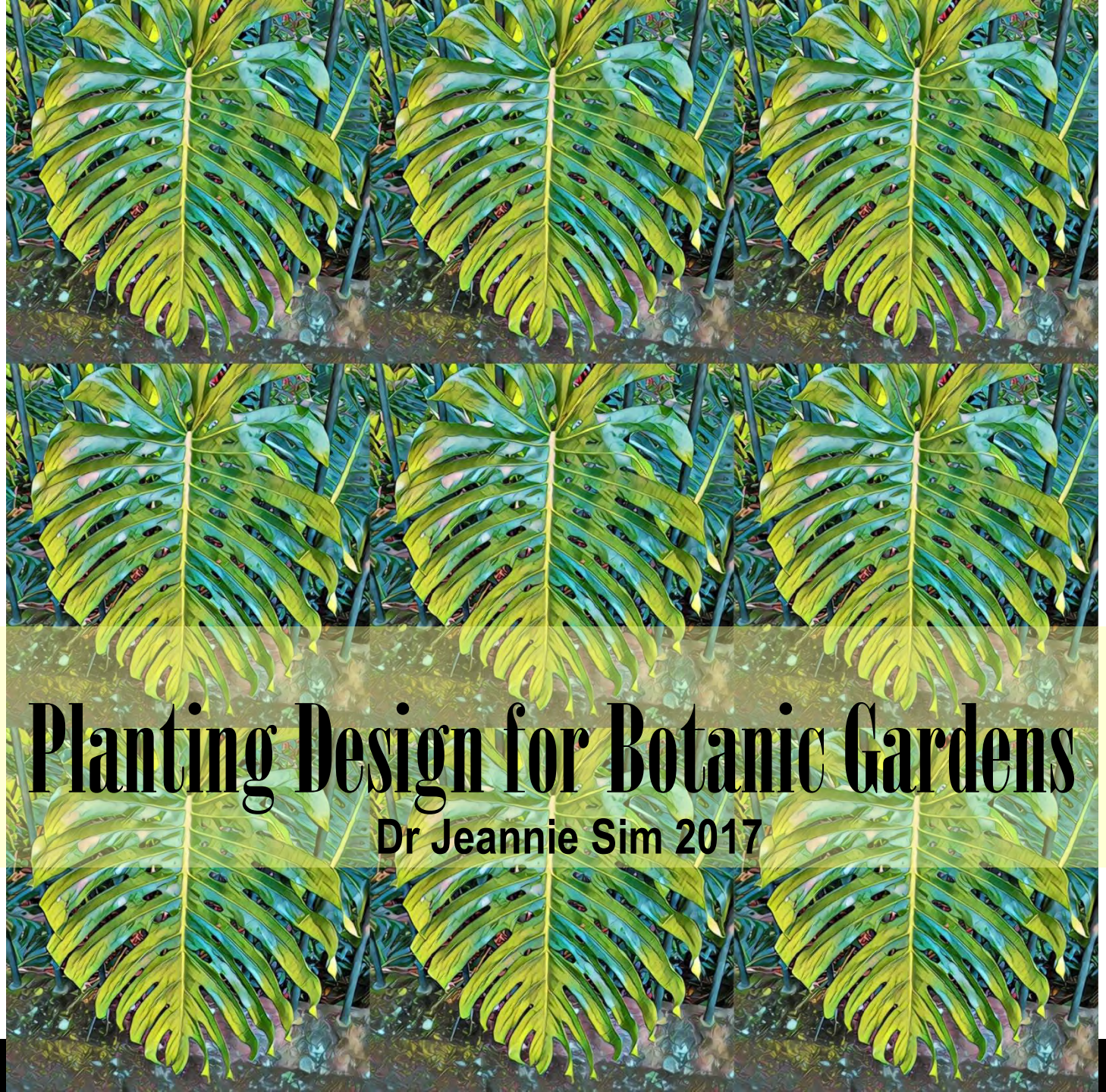


Planting Design for Botanic Gardens

Dr Jeannie Sim 2017

Contents ~ and incomplete collation!

- Designing for Display: main purpose of Botanic Gardens
- Close-up + Distant Viewing
- Arboretum arrangements
- Assemblages
- Collections of Plants
- A dozen 'new' ways of seeing

Burle Marx drawing from Montero, Marta Iris (2001) *Burle Marx: The Lyrical Landscape.* pg.174.

Designing for Display

Botanic Gardens are places of learning and horticultural excellence.
They are curated museums of living plant collections

- Plants as treasured genetic resources: scientific values
- For their usefulness to people: economic values
- For their landscape design uses: design + horticultural values
- For their traditional associations and meanings: historic values
- For their healing qualities: medical + spiritual values
- For their visual interest: aesthetic + spiritual values

Plants in BGs have a combination of these values and uses.

They need to be arranged and displayed accordingly.

Close-up and Distant Viewing

Close-up to plant for detailed observation, touching and fragrance.
Distant views to see overall form and size of plants.

Sherwood Arboretum + Brisbane River

Pitaya, Dragon Fruit flower

Space for the long view

Old Brisbane Botanic Gardens

Space for the long view

Old Brisbane Botanic Gardens

Space for the long view

Old Brisbane Botanic Gardens

Colvillea racemosa

Arboretum arrangement

Arboreta contain collections of trees (and various woody plants including some shrubs) typically without the massing of garden beds.

- Arboreta can be like forestry plots; regularly spaced monocultures with more variety. Imagine the forester as garden designer!
- Compare with the ecology of real woods and forests which have mixtures (assemblages) of trees, shrubs, climbers, herbaceous plants, etc.
- Visually, the simplicity of big trees and open space (grassed or mulched ground) can be very seductive. There is room to observe and admire trees as individual specimens.

Arboretum arrangements

Sherwood Arboretum 31 October 2015

Trees in the open (grass groundcover)

Arboretum arrangements

Sherwood Arboretum 31 October 2015

Arboretum arrangements

Sherwood Arboretum 31 October 2015

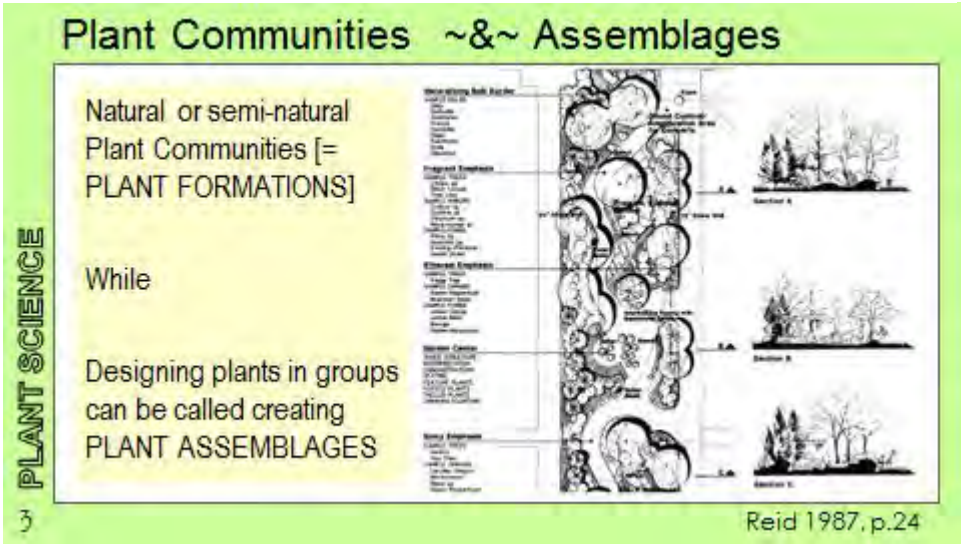
Arboretum arrangements

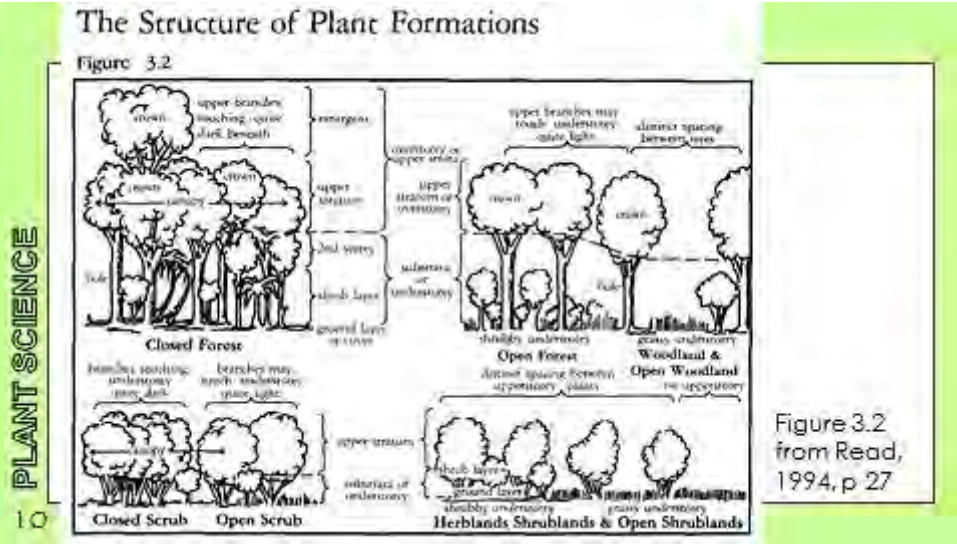
Sherwood Arboretum 31 October 2015

Assemblages

Botanic Gardens contain many sorts of plant groupings, sometimes mimicking natural ecosystems.

- Massed plantings of many sorts of species!
- Variety of arrangements: regular, irregular, mixtures
- Variety of layers: one layer (arboretum), 2 layers, 3 layers…





Reminders

From DLB320 Landscape Horticulture

PLANT SCIENCE

THREE-LAYER assemblages

Tree, shrub, field layers:

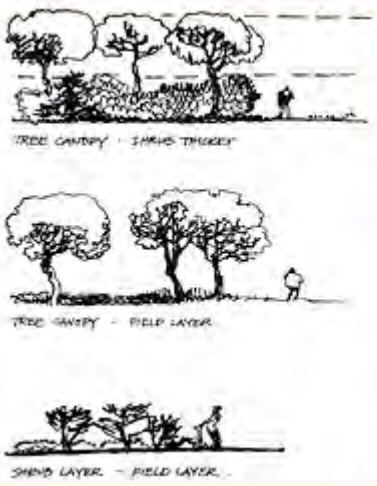
- Layers in Mature Open Woodland
- In the Innerstand of Naturalistic or Exotic planting
- At Woodland edge:

species diversity?
structural diversity?
seasonal diversity?

Robinson, 2004, p 137

37

PLANT SCIENCE



TWO-LAYER assemblages

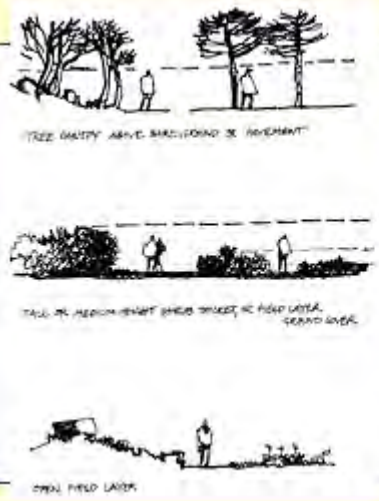
- Tree canopy & shrub thicket
- Tree canopy & field layer
- Shrub layer & field layer

species diversity?
structural diversity?
seasonal diversity?

Robinson, 2004, p 141

38

PLANT SCIENCE



SINGLE-LAYER assemblages

- Tree canopy above bare ground or pavement
- Tall or medium height shrub thicket, or field layer groundcover
- Open field layer

species diversity?
structural diversity?
seasonal diversity?

Robinson, 2004, p 143

39

PLANT SCIENCE

Plant Forms in Design

FORM-[HABIT]-TREE-[woody]=		FORM-[HABIT]-SHRUB-[woody]=		GROUNDCOVER-[herbaceous]=	
Open e.g. Eucalyptus		Vase-shaped e.g. Crotonia		Upright / bushy / large e.g. Strelitzia, Musa, Alpinia, Dracaena, Philodendron	
Rounded e.g. Brush box		Upright e.g. Sacred bamboo		Spreading e.g. Gazania, bromeliadsin	
Columnar (top point) e.g. Cook Island pine(if very narrow = Fastigiate)		Rounded e.g. Westringia		Carpet e.g. Erigeron, native violets	
Columnar (blunt top) e.g.		Open e.g. Howea, Leptospermum		Clumping / rosettes e.g. Canna, Agave, Aloe, Clivia	
Conical e.g. Liquidambar, blue spruces		Arching e.g. Bougainvillea, Spiraea		Tufty / spikes e.g. Liriope, Dianella, ornamental grasses	
Broad-headed e.g. Poinciana		Irregular/twisted e.g. Banksia, Poinsettia		Vertical climber/twiner e.g. wisteria, creeping figs	
Weeping e.g. Weeping Willows		Tufty / spikes e.g. Yucca, Pandanus		Horizontal trailing e.g. Star jasmine, Monstera	
Horizontal e.g. Cedar of Lebanons		Spreading / horizontal e.g. Grevillea 'Robyn Gordon'			
Twisted e.g. Banksian					

Source: Appendix C from Sim, Jean (2015) *Planting Design Sourcebook*, p. 47

Also refer to Robinson, 2004 Chapter 3 Spatial Characteristics of Plants

40

Assemblages

Sherwood Arboretum 31 October 2015 + Fernberg (Govt House)

Massed groups of different plants

Assemblages

TOP: OBBG BTM: QUT/GP + MCBG

Massed groups of different plants

Collections of Plants

For more, refer to Lecture "Botanic Gardens in World History" delivered in DLB525 this year.

Making sense of plants: "plant collection strategies"

- Healing & Teaching Gardens
- Treasure Houses, of economic plants
- Status Symbols
- 'Gardens of Eden'
- 'Arks', conserving species

Botanic Gardens in World History

Dr. Jeannie Sim 2016

OVERVIEW of CONTENTS

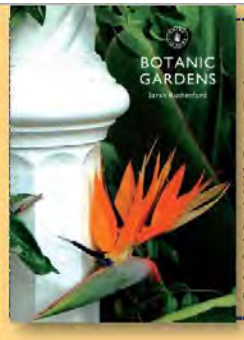
- What is a BOTANIC GARDEN? Arboretum?

CHRONOLOGICAL OVERVIEW:

- Physick Gardens and herbal medicine
- Science (Botany), Herbaria and living plant collections
- Colonial Expansion and botanic gardens
- Contemporary botanic gardens

ARRANGEMENTS (design approaches)

Summary



Rutherford, Sarah 2015. *Botanic Gardens*. Oxford: Shire Publications.

Botanic Gardens in World History 6

SYSTEMATIC ARRANGEMENTS are either 'artificial' or 'natural'.

Not the same as contemporary naturalistic planting!

'Artificial' arrangements include:

[1] morphological
[2] split arrangement
[3] geographical
[4] plant physiology
[5] ecological
[6] useful plants
[7] fossil plants
[8] chronological
[9] themed collections
[10] other arrangements
[11] Linnaean 'Sexual System'.

Attempts at 'Natural' arrangements include:

[1] Jussieuean System
[2] Bentham and Hooker
[3] Engler
[4] Takhatajan
[5] Cronquist.
[all TAXONOMIC ARRANGEMENTS]

(Sim 1990, 71-84)

While landscape design history reveals many design approaches (or styles), botanic gardens are mostly concerned with scientific matters and have used other ways to arrange their living plant collections.

Some BGs have **SYSTEM GARDENS** or ORDER or FAMILY BEDS (arranged according to whatever taxonomic system is in current use!)

Linneaus may have given us the useful BINOMIAL NAMING SYSTEM, but his taxonomic system has not been used for centuries.

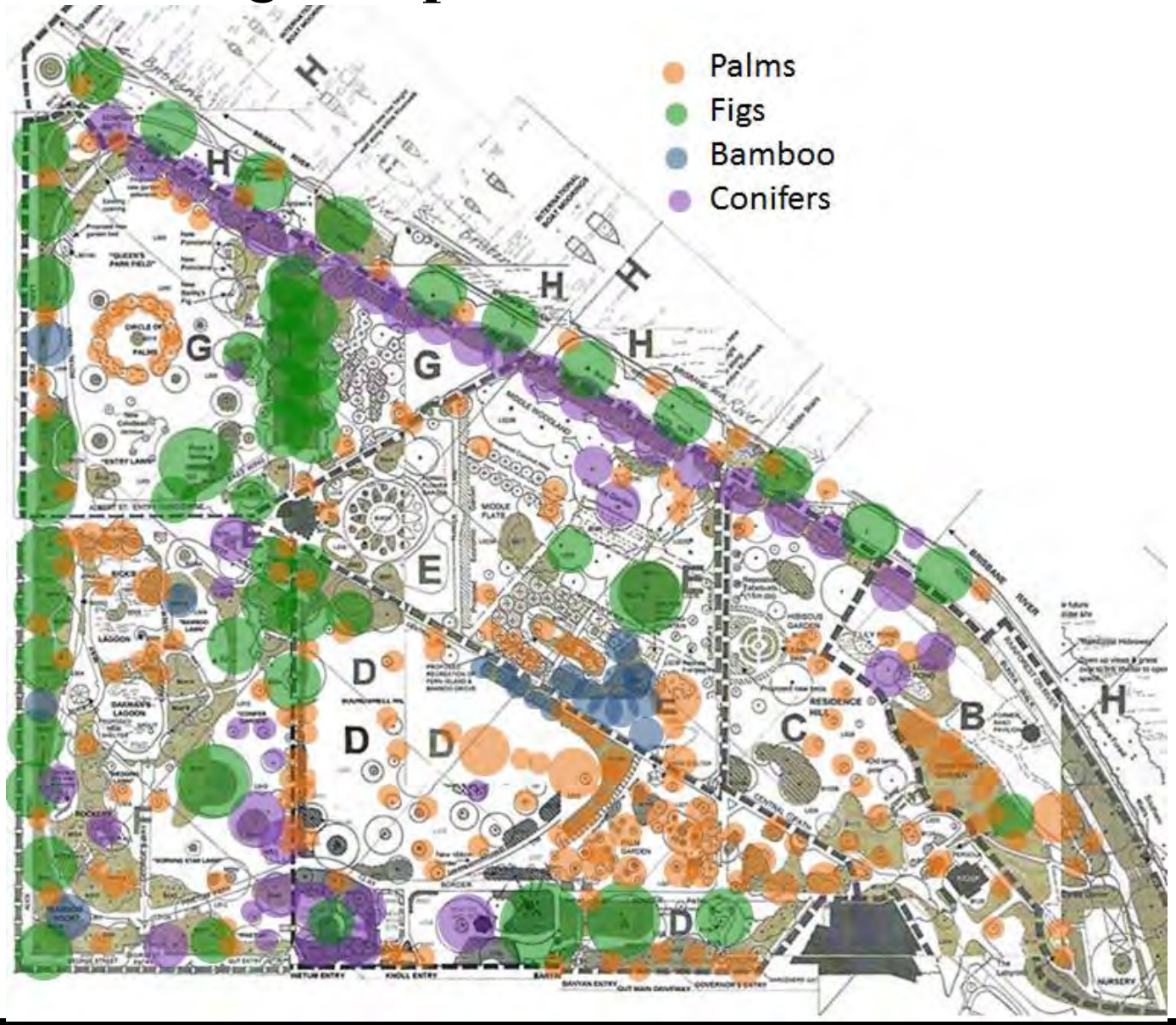
ARRANGEMENTS of COLLECTIONS

Botanic Gardens in World History 47

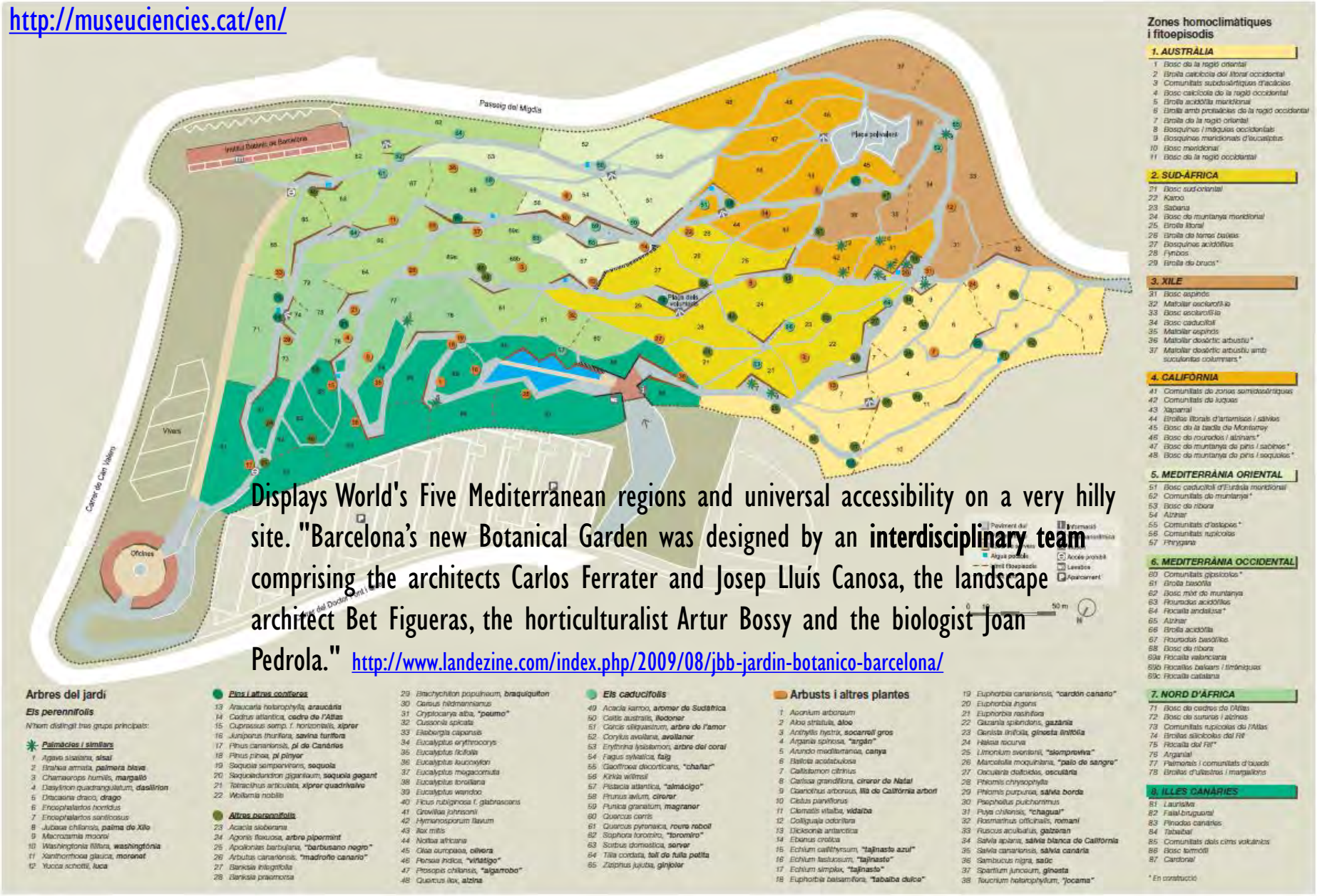
City Botanic Gardens ~ Plant Collections

- Palms
- Figs
- Bamboo
- Conifers (Southern Hemisphere)
- Smaller groups ('bean trees', Camellia, Hibiscus, etc.)

Rough map of collections in CBG



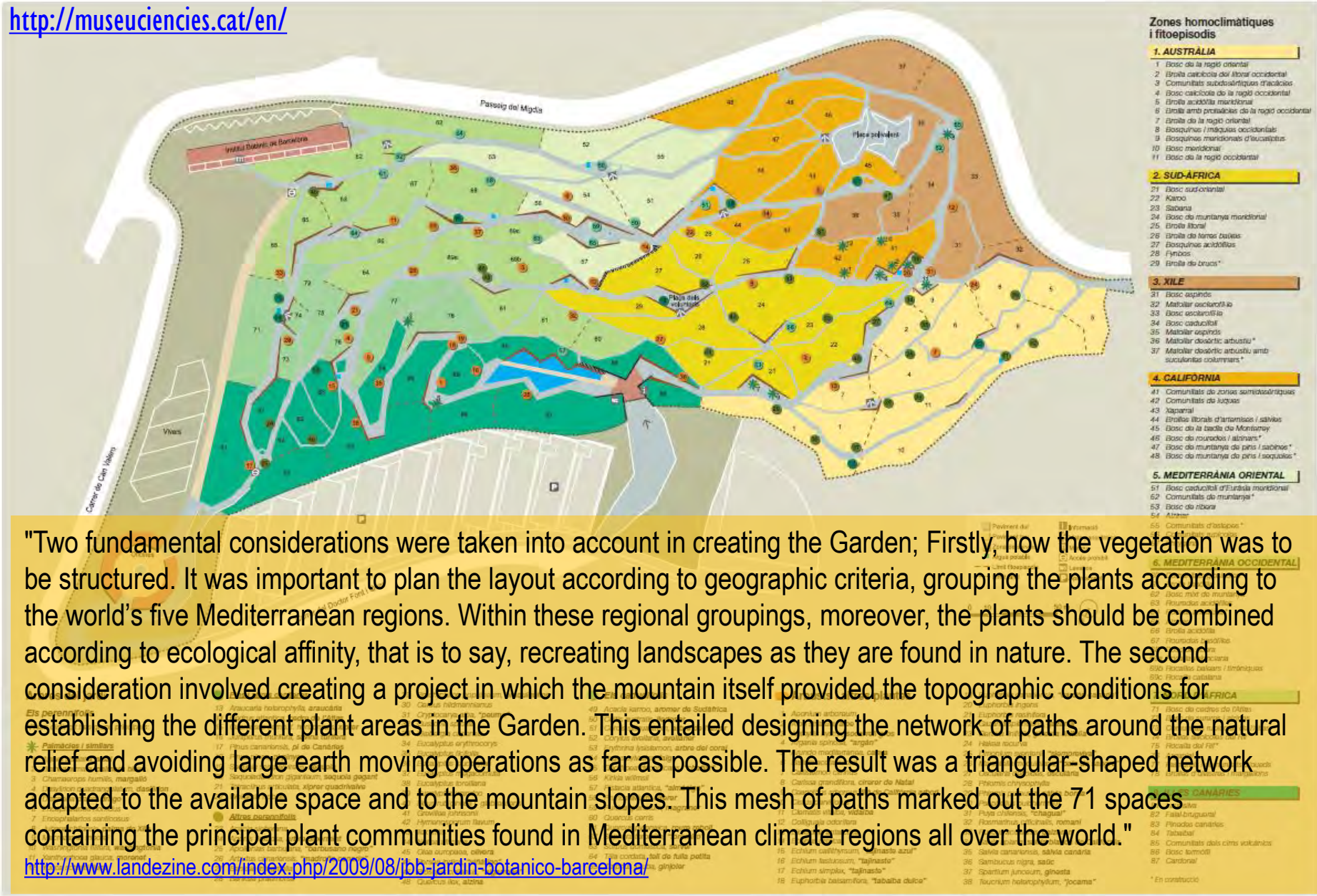
http://museuciencies.cat/en/



Displays World's Five Mediterranean regions and universal accessibility on a very hilly site. "Barcelona's new Botanical Garden was designed by an **interdisciplinary team** comprising the architects Carlos Ferrater and Josep Lluís Canosa, the landscape architect Bet Figueras, the horticulturalist Artur Bossy and the biologist Joan Pedrola." http://www.landezine.com/index.php/2009/08/jbb-jardin-botanico-barcelona/

Jardí Botànic de Barcelona (1999)

http://museuciencies.cat/en/

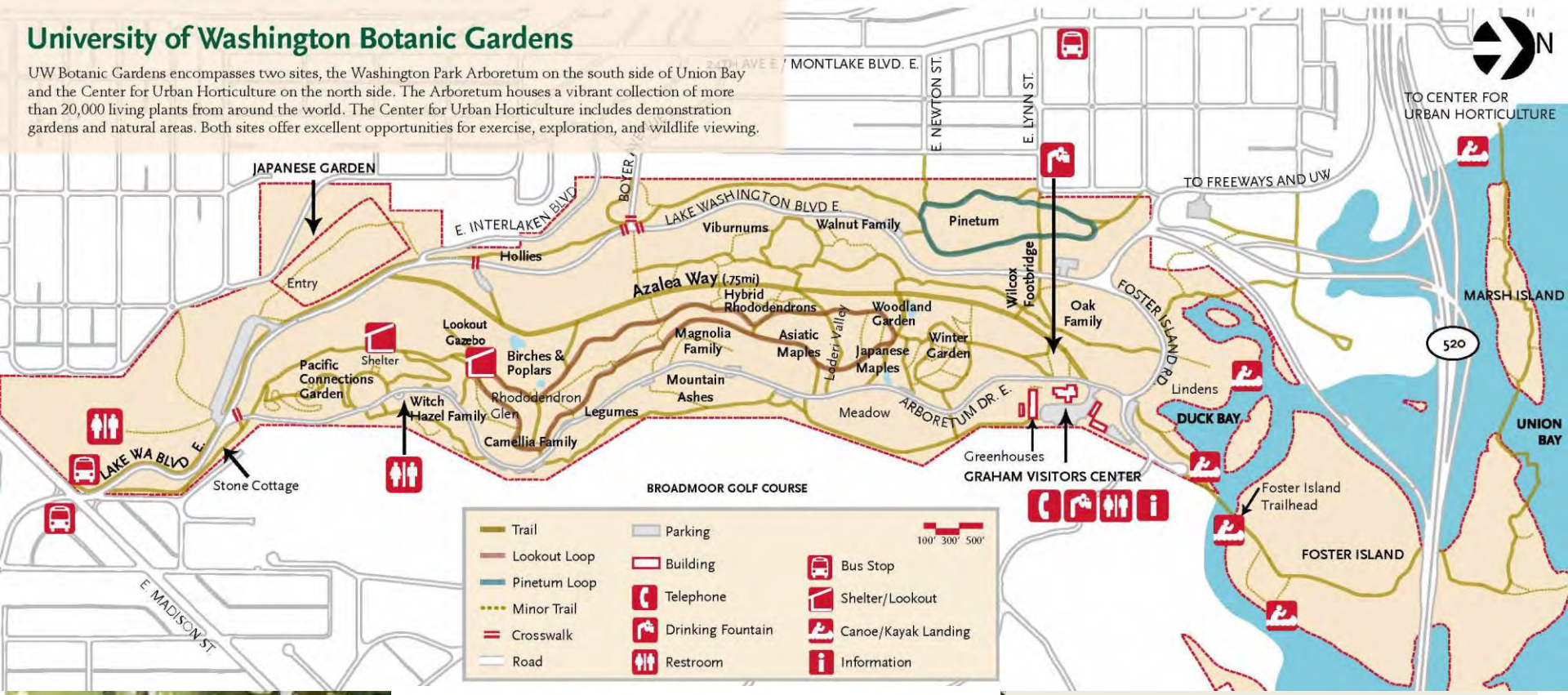


"Two fundamental considerations were taken into account in creating the Garden; Firstly, how the vegetation was to be structured. It was important to plan the layout according to geographic criteria, grouping the plants according to the world's five Mediterranean regions. Within these regional groupings, moreover, the plants should be combined according to ecological affinity, that is to say, recreating landscapes as they are found in nature. The second consideration involved creating a project in which the mountain itself provided the topographic conditions for establishing the different plant areas in the Garden. This entailed designing the network of paths around the natural relief and avoiding large earth moving operations as far as possible. The result was a triangular-shaped network adapted to the available space and to the mountain slopes. This mesh of paths marked out the 71 spaces containing the principal plant communities found in Mediterranean climate regions all over the world."
http://www.landezine.com/index.php/2009/08/jbb-jardin-botanico-barcelona/

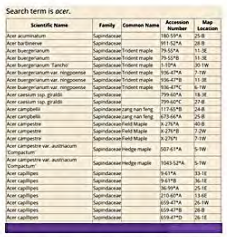
Jardí Botànic de Barcelona (1999)

University of Washington Botanic Gardens

UW Botanic Gardens encompasses two sites, the Washington Park Arboretum on the south side of Union Bay and the Center for Urban Horticulture on the north side. The Arboretum houses a vibrant collection of more than 20,000 living plants from around the world. The Center for Urban Horticulture includes demonstration gardens and natural areas. Both sites offer excellent opportunities for exercise, exploration, and wildlife viewing.



PLANT COLLECTIONS



COLLECTIONS DATABASE

INTERACTIVE MAP

ADVANCED MAP

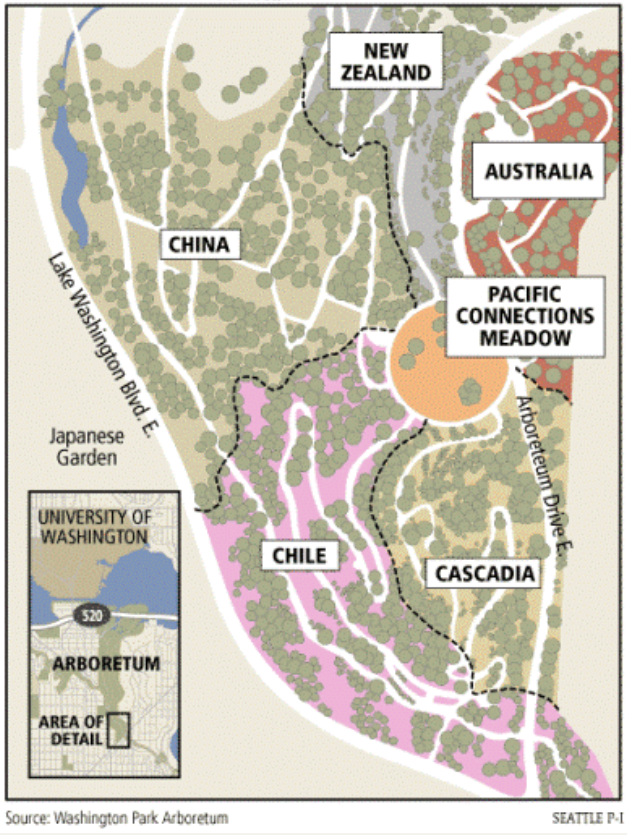
PLANT PROFILES

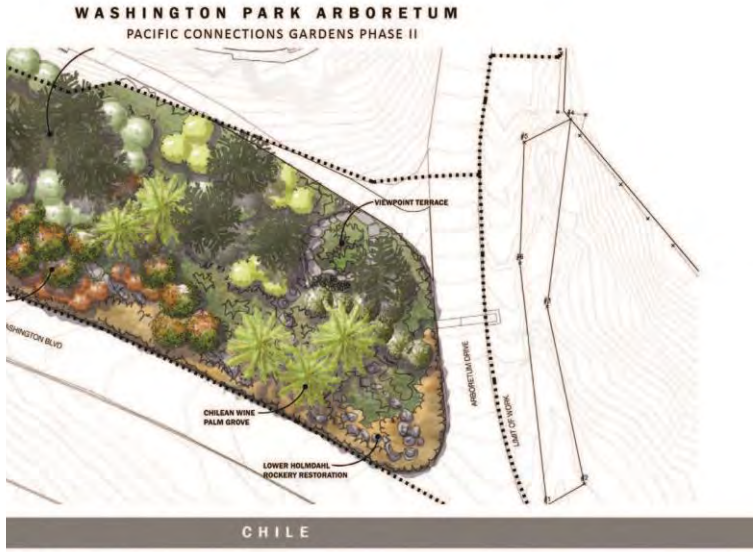
https://botanicgardens.uw.edu/washington-park-arboretum/plants/

Check interactivity of their maps and databases of plant collections!

WASHINGTON PARK ARBORETUM
PACIFIC CONNECTIONS GARDENS PHASE II

https://botanicgardens.uw.edu/washington-park-arboretum/





The iconic plants are depicted in the signage and grown in the preview gardens surrounding the meadow. Western red cedar (*Thuja plicata*) for Cascadia; monkey puzzle tree (*Araucaria araucana*) for Chile; snow gum (*Eucalyptus pauciflora*) for Australia; ginkgo (*Ginkgo biloba*) for China; and New Zealand flax (*Phormium tenax*) for New Zealand – each iconic plant tells a story about the importance of plants in that culture.

NEW ZEALAND FOREST

A dozen 'new' ways of seeing

SKYWAYS tree canopy walkways

TOWERS Aerial views across landscape. Lookouts for outlooks

DECKS raised boardwalks through heath/bog gardens)

BRIDGES Walkways over water to view water plants from above

RAISED BEDS bringing the ground closer to the human eye

ROCKERY ROCK GARDENS wall gardens

SLOPES, MOUNDS or TIERS planting beds to maximise plant visibility

CONTAINER pots, planters, hanging baskets, moveable or fixed, podiums

BUILDINGS for plants pergolas, arbours, trellises, shadehouse glasshouse

EPIPHYTES plants growing on other plants

AQUARIUM glass-sided for water plants

CUTAWAYS through bed/pot glass-sided for viewing roots

A dozen 'new' ways of seeing

SKYWAYS tree canopy walkways

TOWERS Aerial views across landscape. Lookouts for outlooks

https://www.thesun.co.uk/news/2762765/thrill-seeking-tourists-have-been-visiting-a-590-foot-skyway-in-a-chinese-national-park/

http://www.gardensbythebay.com.sg/en/attractions/ocbc-skyway.html

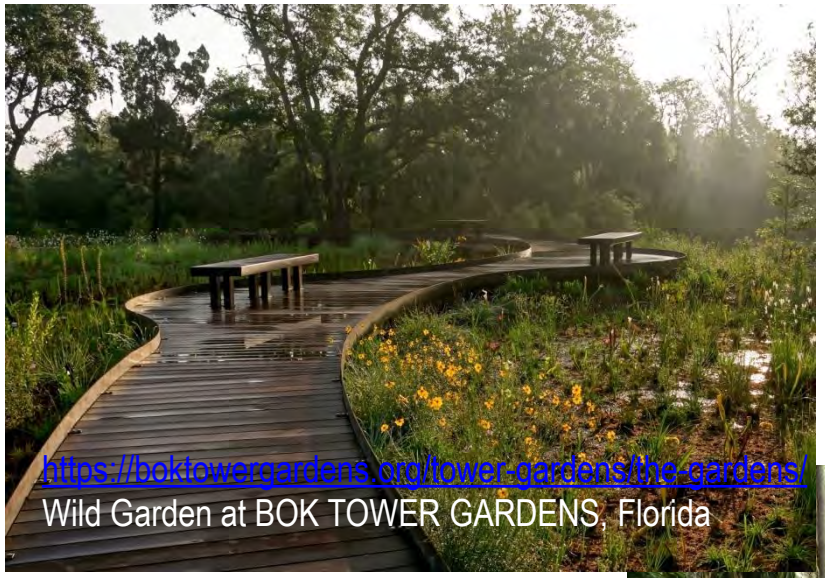
http://omicrono.elespanol.com/2015/09/el-puente-de-cristal-mas-largo-del-mundo/

http://www.gardensbythebay.com.sg/en/plan-your-visit/gardens-map.html

A dozen 'new' ways of seeing

http://www.west8.nl/projects/simcoe_wavedeck/

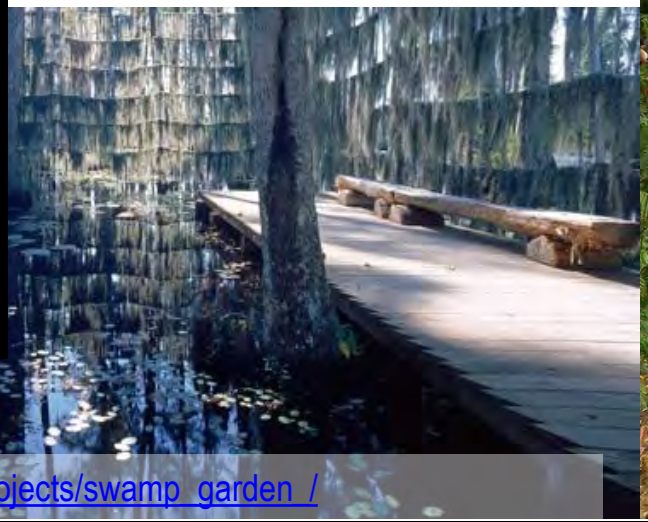
DECKS raised boardwalks through heath/bog gardens)

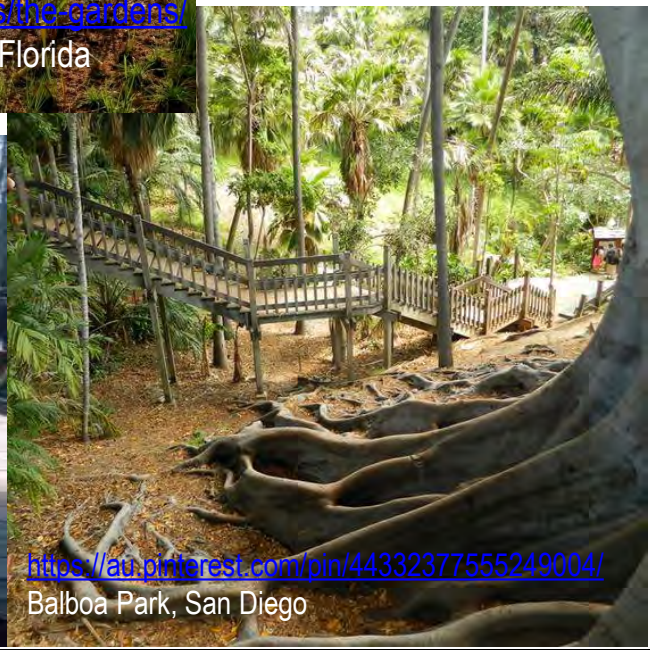


https://boktowergardens.org/tower-gardens/the-gardens/

Wild Garden at BOK TOWER GARDENS, Florida

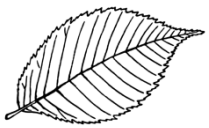
BRIDGES Walkways over water to view water plants from above





https://au.pinterest.com/pin/443323775552490 04/

Balboa Park, San Diego



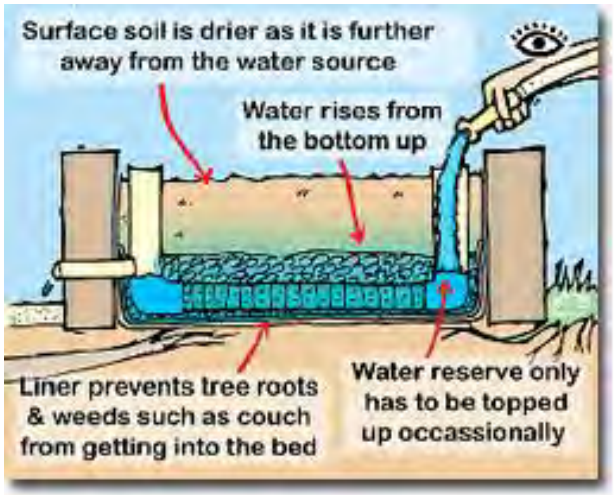
http://www.west8.com/projects/swamp_garden_/

A dozen 'new' ways of seeing

https://au.pinterest.com/explore/cheap-raised-garden-beds/?lp=true

RAISED BEDS bringing the ground closer to the human eye

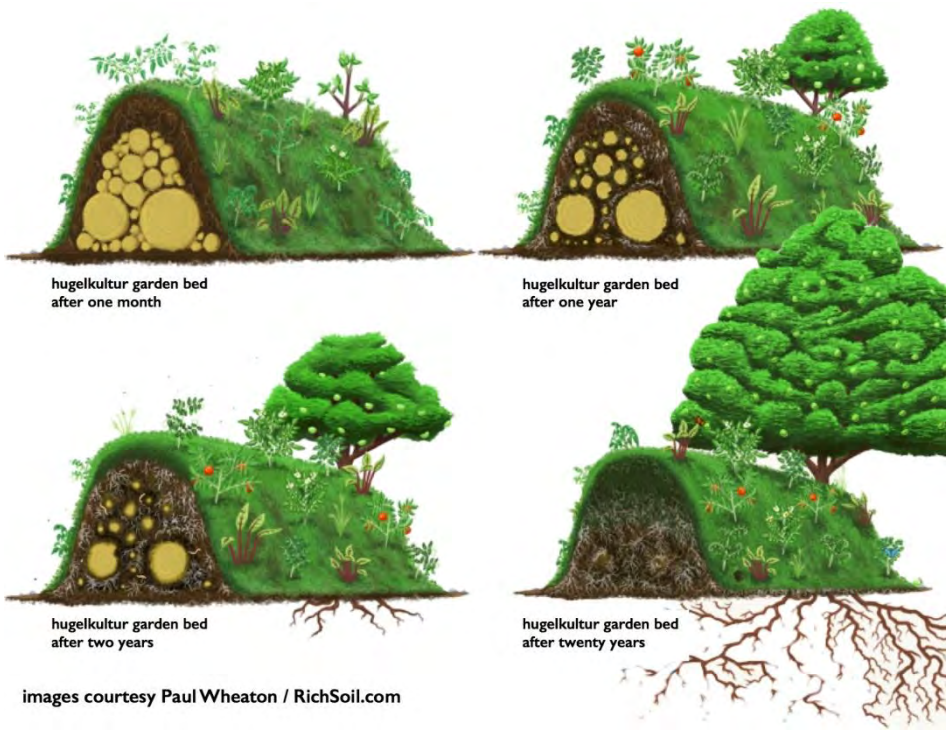
http://www.homemadehomeideas.com/20-gorgeous-garden-bed-edging-ideas-that-anyone-can-do/



ROCKERY ROCK GARDENS wall gardens

https://permaculturenews.org/2011/06/20/from-the-bottom-up-a-diy-guide-to-wicking-beds/

A dozen 'new' ways of seeing



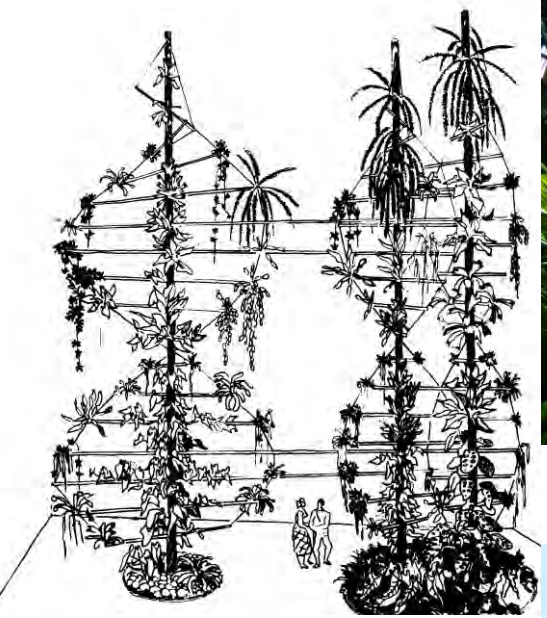
https://www.craftsy.com/blog/2015/04/hugelkultur/
Along with their enormous potential size, hugulkultur beds differ in featuring much steeper sides than most other lasagna-bed type approaches. Keeping the sides sloped at about 45 degrees is believed to reduce soil compaction over time and increase soil oxygenation.

SLOPES, MOUNDS or TIERS planting beds to maximise plant visibility

CONTAINER pots, planters, hanging baskets, moveable or fixed, podiums

https://www.permaculture.co.uk/articles/many-benefits-hugelkultur

A dozen 'new' ways of seeing



Burle Marx drawing from Montero, Marta Iris (2001) *Burle Marx: The Lyrical Landscape.* pg.107.

https://au.pinterest.com/pin/308426274463889601/
Garden Building (shadehouse)
Balboa Park, San Diego

https://thesophomoreslump2.com/2012/06/26/botanical-garden-in-balboa-park/

BUILDINGS for plants pergolas, arbours, trellises, shadehouse glasshouse

EPIPHYTES plants growing on other plants

Expo 88 design by Lawrie Smith

A dozen 'new' ways of seeing

http://www.mydomainehome.com.au/root-plants-in-water

https://www.studyblue.com/notes/note/n/rooted-plants-with-floating-leaves/deck/14448538

AQUARIUM glass-sided for water plants

http://www.aquariumplants.com/

CUTAWAYS through bed/pot glass-sided for viewing roots

Case Study: RBG Cranbourne

https://www.rbg.vic.gov.au/visit-cranbourne/plan-your-visit/map-of-the-gardens

Royal Botanic Gardens, Cranbourne (near Melbourne) 2009

Royal Botanic Gardens, Cranbourne (near Melbourne) 2009

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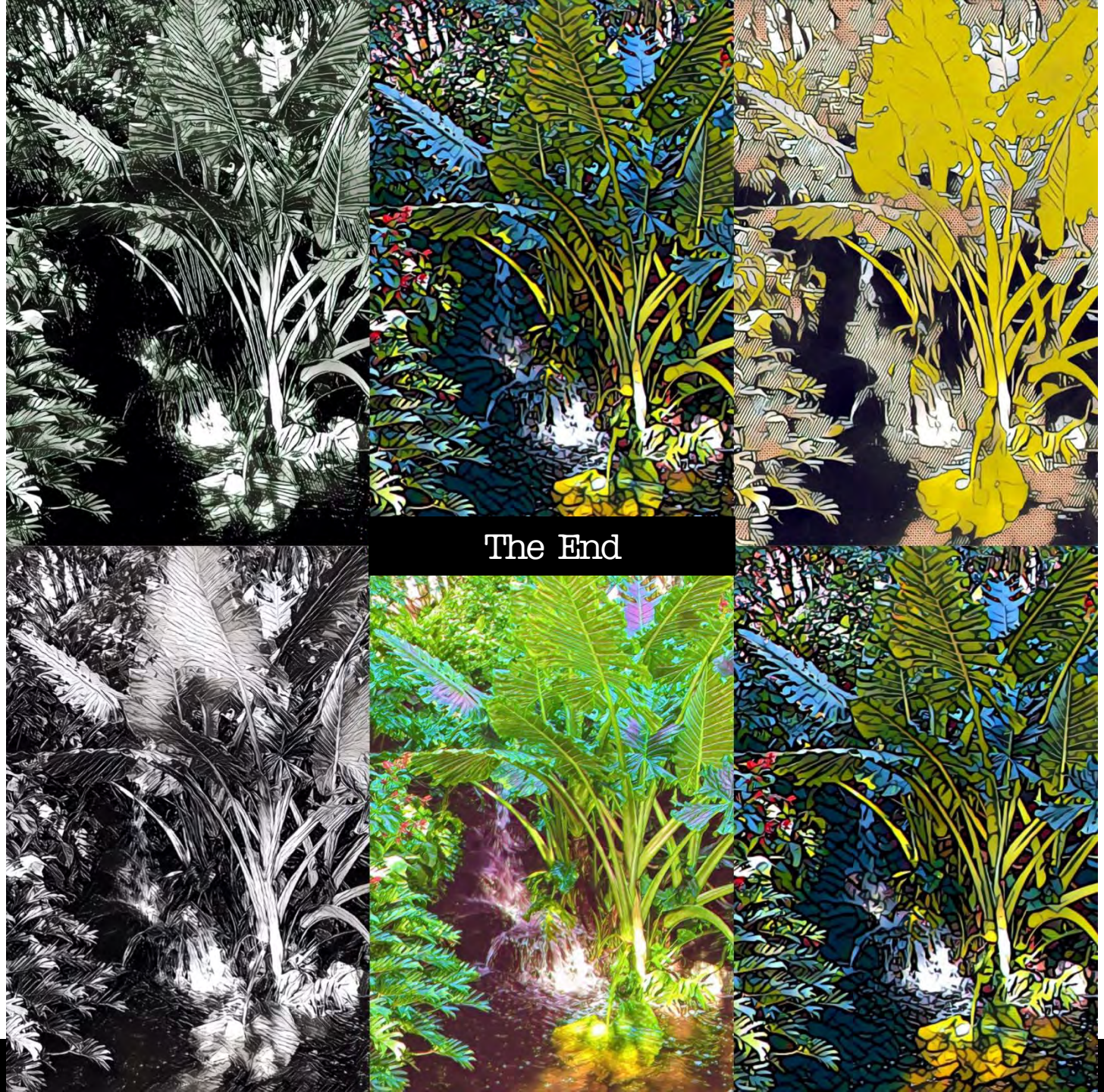
The End