CHAPTER 7-5
GARDENING: PUBLIC GARDENS

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Figure 1. Jassy moss house. This unusual garden transports you into another world. Photo courtesy of Ben Tan.

Botanical Gardens

Botanical gardens often have a bryophyte section, sometimes mimicking a Japanese garden. Some use mosses around indoor or outdoor waterfalls. And some actually label the bryophytes for teaching purposes. As you might guess, this latter practice can be seen in Japan.

Bryophyte gardening has been somewhat limited in North America, but there are notable exceptions. One of these is promoted by Rick Smith, who teaches moss gardening by offering workshops.

As a result of his workshops, Smith was invited to establish a moss garden at the Luthy Botanic Garden in Peoria, Illinois, USA, and a second at the Illinois Central College Arboretum in East Peoria. Both of these gardens have *Dicranum scoparium* (a dark green moss forming cushions; Figure 2), *Polytrichum commune* (Figure 3), *Bryoandersonia illecebra* (Figure 4), *Leucobryum glaucum* (Figure 5), *Hypnum* spp. (Figure 6), *Thuidium delicatulum* (a species that spreads easily; Figure 7), *Anomodon attenuatus* (Figure 8), and *Plagiomnium cusidatum* (Figure 9).

Figure 2. *Dicranum scoparium* with capsules, a common species in moss gardens, public or private. Photo by Janice Glime.
Figure 3. *Polytrichum commune*, a moss frequently occurring in moss gardens. Photo by Alan J. Silverside, with permission.

Figure 4. *Bryoandersonia illecebra*, a moss from the southeastern USA and used by Rick Smith in moss gardens. Photo by Bob Klips, with permission.

Figure 5. *Leucobryum glaucum*; this genus is used in moss gardens all over the world. Photo by Janice Glime.

Figure 6. *Hypnum imponens*, a common sheet moss that appears in moss gardens. Photo by Janice Glime.

Figure 7. Fern moss, *Thuidium delicatulum*, a suitable moss for moss gardens. Photo courtesy of Rick Smith.

Figure 8. *Anomodon attenuatus* on trees, a common species in somewhat alkaline areas. Photo by Janice Glime.
Rick Smith (Bryonet) reports that he uses the mat system in both his own private garden and in public gardens. He uses a thin synthetic mat that stores rainwater similar to the storage by a sponge. As the moisture evaporates from the mosses, they draw more water from the underlying mat. He does not water his gardens, but in many climates watering is necessary, especially when the bryophytes are first getting established. He recommends only rainwater if watering is necessary, but occasional watering with other sources such as distilled water usually won't harm the garden if it is interspersed with frequent natural watering.

George Schenk has moss gardens in Seattle, Washington, USA, New Zealand, and the Philippines, all areas that receive considerable annual rainfall. His book on Moss Gardening received the 1997 Horticultural Society of America’s book of the Year Award. Amazon says of the book "A delightful book that encourages gardeners to pay closer attention to the subtle beauty of miniature landscapes and introduces one of the glories of Japanese gardens into American designs. The author writes entertainingly of mosses on rocks and walls, in containers, and as a lush ground cover, and he presents a gallery of his favorite moss species."

Problems in Public Gardens
Rick Smith (Bryonet 9 February 2010) admonished that the challenge in most public gardens is growing bryophytes in urban areas vs. their natural woodland setting. Traditional moss gardens require a staff to weed the garden of the tracheophyte seedlings.

In public gardens, the gardeners are also the problems. They want to treat the bryophytes like "small vascular plants" that need to be watered and fertilized, but these are just what one must avoid. Care is primarily that of removing unwanted plants and leaf litter.

One additional problem in public gardens is human traffic. Although Annie Martin frequently points out that you should walk on your bryophytes to help in their dispersal, they are not equipped to withstand the parade of an army of people or small children playing tag. This presents the need for paths. These can be presented in a variety of ways, as you will see in the images in this chapter. Sand paths are common, but stone paths can be works of art themselves, with bryophytes filling the spaces between the stones. Wooden steps, including logs, provide niches for additional bryophytes. Care must be taken that there is no smooth wood that might invite algae, hence becoming slippery and a safety hazard.

Moss Gardens of the World
Dale Sievert has visited many gardens, large and small, and has kindly contributed his images for this chapter. This is but a small sampling of moss gardens in the world.

Bloedel Reserve, Washington, USA
The Bloedel Reserve is a 60.7-hectare (150-acre) forest garden on Bainbridge Island in the state of Washington, USA, first opened to the public in 1988. There one can find beautiful mossy landscapes. It includes a Japanese garden with a sand, moss, and rock garden, but many of the bryophyte landscapes in the reserve have a more natural look (Figure 10-Figure 11).

Seattle Japanese Garden, Seattle, Washington, USA
The Seattle Japanese Garden occupies 1.4 hectares (3.5 acres) in the Madison Park neighborhood of Seattle. It was designed under the supervision of the Japanese gardener Juki Iida in 1960. It features pools, streams, bridges, lamps, and the beautiful autumn color of Japanese maples, along with bryophytes (Figure 12-Figure 13).
Portland Japanese Garden, Portland, Oregon, USA

This garden is considered to be the most authentic Japanese garden outside of Japan. It occupies 2.2 hectares (5.5 acres) in the scenic west hills of Portland. The garden was designed by Professor Takuma Tono. One can see crooked paths, waterfalls, arched bridges, moss-covered lanterns, pools with koi, and other features often found in the gardens in Japan. Bryophytes are a prominent feature (Figure 14-Figure 16).

Anderson Japanese Garden, Rockford, IL, USA

These gardens are considered to be premiere among American Japanese gardens (Figure 17-Figure 19). They were established in 1978 when John Anderson, a Rockford businessman, was inspired by his visit to the Portland Japanese Garden. The design was assisted by Hoichi Kurisu, using the Anderson's swampy backyard. With 12 acres of gardens and koi-filled pools, this setting is often used for both peaceful reprise and weddings.
Figure 18. A mixture of round and rectangular steps at the Anderson Japanese Garden, Rockford, IL, USA. Photo courtesy of Dale Sievert.

Figure 19. Water feature with a large, moss-covered rock at the Anderson Japanese Garden, Rockford, IL, USA. Photo courtesy of Dale Sievert.

Golden Gate Park, San Francisco, California, USA

Starting with sand dunes, William Hammond Hall (a park engineer) and master gardener John McLaren created a restful place to escape the bustle of the city. The Golden Gate Park is a large urban park of 411.6 hectares (1,017 acres). In addition to its conservatory of flowers, it presents a Japanese tea garden, an oak forest, a botanical garden that began in 1890, and two Dutch windmills that pump the water to irrigate the garden (Figure 20-Figure 21). More than 8000 varieties of plants occupy the gardens.

Figure 20. Mosses and trees in garden of Golden Gate Park, San Francisco, California, USA. Photo by courtesy of Dale Sievert.

Figure 21. Golden Gate Park, San Francisco, California, USA showing a walking path and a moss lawn. Photo courtesy of Dale Sievert.

Zion National Park, Utah, USA

Zion National Park covers 593 km² (229.1 mi²) and is characterized by rivers in deep canyons, colorful stone cliffs, waterfalls, and fantastic views. Despite the xeric nature of most of the park, one can still find bryophytes there (Figure 22). In 1909, the area was established as a National Monument by President William Henry Taft. But its name of Mukuntuweap National Monument drew criticism because it was difficult to pronounce. In 1918 it was renamed to Zion, the name that had been used by the Mormons who settled there. In 1919 it was established by The United States Congress as a national park.

Figure 22. Moss along walk in Zion National Park, Utah. Photo courtesy of Dale Sievert.

Missouri Botanical Garden, St. Louis, Missouri, USA

The Missouri Botanical Garden was founded in 1859 and is the oldest botanical garden in the USA. The garden is comprised of 32 hectares (79 acres) and includes a Japanese strolling garden (Seiwa-en) of 5.7 hectares (14 acres). Designed by Koichi Kawana, this is the largest Japanese garden in North America (Figure 23).
Figure 23. Moss lawn in the Missouri Botanic Garden, St. Louis, Missouri. Photo courtesy of Dale Sievert.

**Rotary Botanical Garden, Janesville, Wisconsin, USA**

The Rotary Botanical Garden in Janesville is an 81 hectare (20-acre) reprise. Bryophytes can be seen along some of the paths and in the Japanese garden, and some have managed to establish themselves between the stones of the paths (Figure 24). Of interest to the bryologists is the fern and moss garden.

Figure 24. Path and balls of mosses at the Rotary Botanic Garden, Janesville, Wisconsin, USA. Photo courtesy of Dale Sievert.

**Sarah Duke Gardens, Durham, North Carolina, USA**

The Sarah Duke Gardens comprise approximately 22 hectares (55 acres) of landscaped and wooded areas at Duke University. There are 5 miles of allées, walks, and pathways throughout the gardens. The official beginning of the gardens was 1934, when Dr. Frederick Moir Hanes, a faculty member at the Duke Medical School, persuaded Sarah P. Duke to provide $20,000 toward planting flowers in a debris-filled ravine. But alas, the gardens were destroyed in 1935 by a flood. Sarah Duke's daughter provided funds to rebuild the gardens above the flooding zone as a memorial to her mother, who died in 1936. In parts of the gardens, the ground is covered by a restful green mat of bryophytes (Figure 25).

Figure 25. Path in moss and shrub garden at Sarah Duke Gardens, Durham, NC, USA. Photo courtesy of Dale Sievert.

**Limahuli Gardens, Kauai, Hawaii, USA**

The Limahuli Gardens are part of the Limahuli Preserve and occupy 6.9 hectares (17 acres) among the 399 hectares (985 acres) of the preserve. The gardens were built to "honor the connection between nature and humanity." This is in one of the last easily-accessible valleys where native forest, pristine streams, and archaeological complexes remain. The descendants of its original inhabitants are its caretakers. In 1967, after Hawaii became a state, Juliet Rice Wichman, a member of the Hui, was assigned to develop the new park. She immediately began to plan and plant. She bequeathed the gardens to one of her grandsons. Since its beginnings it has been awarded "Best Natural Botanical Garden" from the American Horticultural Society for demonstrating the "best environmental practices of water, soil, and rare plant conservation in an overall garden design" and the Koa Award for dedication to the perpetuation of the Hawaiian culture. Bryophytes contribute to the lushious natural landscape (Figure 26).

Figure 26. Mosses and tropical vegetation in the Limahuli Gardens, Kauai, Hawaii, USA. Photo courtesy of Dale Sievert.

**Sikkum, India**

In Sikkum, one can find many walls with mounds of mosses growing on the sides and tops. Waterfalls are green with bryophytes. And bryophytes adorn the forest floor and branches (Figure 27-Figure 28).
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Figure 27. Moss epiphytes in Sikkum, India. Photo courtesy of Dale Sievert.

Figure 28. Mosses at Sikkum, India. Photo courtesy of Dale Sievert.

Floriade, Venlo, Holland

This garden at Floriade represents modern architecture that utilizes bryophytes in the design (Figure 29).

Villa d’Este, Tivoli, Italy

The Villa d’Este is near Rome, Italy. It is adorned with numerous fountains, some of which are covered with bryophytes (Figure 30).

Herculaneum, Italy

Herculaneum rests in the shadow of Mount Vesuvius. It was an ancient Roman town destroyed in 79 AD by volcanic pyroclastic flows. Only ruins remain of the ancient town, and ruins often provide suitable substrates for bryophytes (Figure 31). But more recent statues may be covered with bryophytes (Figure 32).

Figure 29. Moss garden at Floriade, Venlo, Holland. Photo courtesy of Dale Sievert.

Figure 30. Villa d’Este fountain with mosses. Photo courtesy of Dale Sievert.

Figure 31. Herculaneum, Italy, ruins with mossy surfaces. Photo by Xstreambar, through Creative Commons.
Educational Displays

A number of gardens serve educational needs. This may be the entire garden, or only small portions. This education is usually accomplished by signs. Some gardens include a feel garden, especially pitched toward the blind, but can also be attractive to children. Mosses offer a wide range of textures that can be a delight to those meeting them for the first time. Additional information can be provided in Braille.

The Moss House (Figure 33-Figure 34) in India is designed for teaching. The bryophytes are planted and the species patch is outlined with white rocks (Figure 35-Figure 36). A label is placed on a stake in the patch. A simpler design without the feel of a garden is to plant bryophytes in pots and provide them with a label (Figure 37).

Indoor gardens like the Moss House require watering. This is best done with an automatic misting system (Figure 38), but care must be taken to create the appropriate regime. A filtering system might be needed to remove chlorine and unwanted minerals from the water. A fan may be needed to prevent mold.

Figure 32. Mossy statuary fountain at Herculaneum, Italy. Photo courtesy of Dale Sievert.

Figure 33. Moss house where mosses are inside a shaded greenhouse. Photo courtesy of Virendra Nath.

Figure 34. Moss greenhouse in preparation, showing a fountain that will help to maintain moisture. Photo courtesy of Virendra Nath.

Figure 35. Labelled bryophytes in the Moss House, showing the white rock and label system used to identify the species. Photo courtesy of Virendra Nath.

Figure 36. Plagiochasma appendiculatum showing white rocks and labelling. Photo courtesy of Virendra Nath.
Summary

Public gardens occur all over the world, and many have sections with bryophytes, especially in Japanese gardens. These bryophytes require caretakers who understand the differences in the needs of bryophytes, avoiding fertilizers and maintaining boundaries between species. Watering may also be necessary.

This chapter has only a small sampling of public gardens with mosses, including some that have attempted to mimic the Japanese gardens.

Acknowledgments

Dale Sievert made this chapter possible with his images of gardens with mosses from all over the world, and especially from North America. Virendra Nath contributed images from the Moss House that formed the basis of the Educational Displays section.

Labelling

In an arboretum labels help us to learn the names of the trees. Few gardens exist where a similar education is available for bryophytes. I quickly learned one of the problems of providing such labels for bryophytes. I learned that the field trip I had been asked to lead would have 60 participants. I went armed with a stack of pink computer cards. At each bryophyte, I placed a card with the name of the species. But the bryophytes were small and the cards were large. Many of the cards touched several species. That is only part of the problem in a bryophyte garden. As time passes, the species that is labelled can expand or get overgrown by other bryophytes. Furthermore, to most people, all bryophytes look pretty much the same. One Botanical Garden has attempted to solve the problem by locating a large patch of the bryophyte and attaching a label, then posting information explaining the characters used to identify the bryophyte and providing other useful information about it (Figure 39).