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Renovation of the Morris Arboretum Herb Garden

Title: Renovation of the Morris Arboretum Herb Garden

Author: Jay Priddy, Rose and Flower Garden Intern

Date: March 2004

Abstract:

Public interest in herbs, especially medicinal herbs, has grown since the current Herb Garden was planted at the Morris Arboretum in 1995. The original design has become compromised over time, as some plants have weakened and died out while others have become overgrown. The overall balance and aesthetic appeal has been reduced as many new plants have been added without regard to the original design. The objective of this project is to refurbish this area to add seasonal interest, increase the educational value and meet the overall expectations the public has for an Herb Garden today.

Ultimately, the simplest way to accomplish this is to start from scratch and completely renovate the beds. A basic plan involving five areas of concern is as follows:

- 1) Remove the remaining plants and improve the soil environment.
- 2) Upgrade the access paths to the outer edges of the beds.
- 3) Develop a new design adding seasonal interest and create an appealing garden in which the visitor lingers and learns about herbs. Maintain the emphasis on medicinal herbs.
- 4) Increase the educational value with more plant labels and additional information.
- 5) Provide a definition and reference guides for the Herb Garden outlining the future maintenance of this area and allowing for prolonged continuity of the design.

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 C: Herb Garden Reference Guides (to be completed at later date)

 D: Drawings (located in Gates Hall Library map drawers due to size)

BACKGROUND ON HERBS

Mankind has used herbs for tens of thousands of years. Archeological finds from Egypt dating back to 2000BC indicate a knowledge and use of many herbs in that society. Written records that refer to herbs include a 3,500 year-old Egyptian papyrus and even more ancient Chinese herbals that remain in use today. Long before medical science became reputable, people relied on herbalists for potions, tonics and cures for every ailment suffered by humanity. Renewed interest in herbal remedies has blossomed into global trade worth billions of dollars and increased research to verify and isolate the chemicals responsible for these actions.

But what exactly is an herb? Many definitions indicate an herb is any plant used for medicines, culinary flavorings, fragrances, and dyes. This includes a wide range of organisms from towering trees to minute fungi. Though Western familiarity with herbaceous annuals, biennials and perennials dominate the list of herbs, the complete roster covers an amazing range of unusual plants from seaweed to common weeds. Even the pesky *Pinellia ternata* has its uses in Chinese herbal medicine (to treat skin sores and relieve nausea and vomiting). Every conceivable part of a plant from root and tuber to bark and sap may be used for its herbal qualities.

Some herbs have altered human history and behavior - opium poppies, tobacco and marijuana come to mind - while others have vastly improved our quality of life. Quinine, the anti-malarial alkaloid isolated from the bark of the cinchona tree, has saved millions of lives in the tropics. Tamoxifen, a drug used to treat ovarian and breast cancers, is based on taxol, a complex poly-oxygenated diterpene first isolated from the bark of the Pacific yew. The list goes on and on, and a decent accounting of these stories would fill many volumes.

HISTORY OF HERBS AT THE MORRIS ARBORETUM

While John and Lydia Morris undoubtedly included herbs in the vegetable gardens originally located in the present Rose Garden quadrants, no evidence of a dedicated Herb Garden pre-dates the 1956 installation of a small Garden of Medicinal Plants west of the greenhouse-fernerly complex. This was expanded in 1958 and again in 1960, at the expense of the old conifer nursery. By the early 1960's, a large, informal layout arranged by plant families occupied much of the area south and west of the greenhouses into what we now know as the Sculpture Garden. Records of the plant lists show a remarkable range of herbs with a large number of tropical plants that required over wintering in the greenhouses. In 1958 the Morris Arboretum display of drug plants at the Philadelphia Flower Show won the Award of Merit from the Federated Garden Clubs of Pennsylvania.

The Garden of Medicinal Plants was phased out in the late 1970's for several reasons. One of the major factors was the competition for limited greenhouse space brought on by the increasing number of plants acquired from expeditions around the world. Resources were shifting toward other areas at that time and this garden became a reduced priority at the Arboretum. All that remains today of the original Garden of Medicinal Plants are a few clusters of survivors tucked here and there in the Sculpture Garden (look for the comfrey across the road

from the Dwarf Conifer Garden). Plans drawn up in 1986 for an elegant herb garden to be placed behind Gates Hall never came to fruition.

The Herb Garden was reborn in 1995 with the installation of a Joanna Reed design at the southwest entrance to the Rose Garden. The design utilized a wide range of medicinal and culinary herbs, with some ornamental relatives of herbs, arranged in pleasing drifts on each side of the main path. Small side paths gave access to the outer edges of the beds. The Herb Society of Philadelphia graciously assisted in the maintenance and upkeep of the garden, and the tradition continues today.

CHOOSING A DESIGN STYLE

The driving forces for the renovation design for the Morris Arboretum Herb Garden are based on historical trends and the ornamental qualities of herbs. Different people and cultures have differing expectations on the layout and organization of an herb garden. Enclosed, geometrical plots, each dedicated to a single species, were commonly found on monastic grounds in the Middle Ages. Herbs organized by medicinal properties reflect the physic gardens, or apothecary gardens, of the 17th Century. The practical uses of these gardens meant healing plants, vegetables and orchard crops were grown separately. Formal and intricate knot gardens and elaborate parterres characterized by finely controlled hedges were popular during the Renaissance and long afterwards. The informal style of the landscape gardening movement of the 18th Century placed herbs in the domain of the cottage garden – a dense profusion of plants arranged informally to emphasize form, flower and scent. It is only in the last hundred years or so that garden designers have incorporated many herbs back into beds and borders because of their ornamental qualities.

The sloping site for the Morris Arboretum Herb Garden does not lend itself to the strict formality of a true knot garden or parterre. These styles are also much too labor intensive to be maintained properly with the resources available. A true Cottage Garden is already located to the southeast of the Rose Garden. It is the most recent historical design trend that seems most appropriate for this garden. Repeated elements of hedging plants evoke the typical knot garden many people associate with herb gardens, and the symmetrical bed outlines and structural features qualify this as a more formal layout. However, the focus on the ornamental qualities of the groupings and specimen plantings of herbs definitely gives these beds a relaxed air common in today's more naturalistic designs. This suits the transitional nature of this site between the informal Mixed Border Garden and the formal pattern of the Rose Garden quadrants. It also respects and continues the original 1995 design envisioned by Joanna Reed and others.

SITE ASSESSMENT

One of the challenges in growing herbs is providing the proper environment many of these plants require. That means excellent drainage and a lean soil in most cases. Excess water holding capacity and a rich soil is not beneficial to many herbs. This site is exceptional when its past uses and soil composition are considered. For many years much of this area was a hard-packed roadbed, and the compaction problem was exacerbated when heavy machinery rolled repeatedly over the area as the current roads and paths were installed in 1993. The final problem

was the underlying layer of heavy clay found in some places at just four inches below the surface layer of topsoil

A soil test performed at the Penn State Agricultural Analytical Services Laboratory on samples submitted also indicated a pH marginally higher than that preferred by many herbs. The results were pH 7.2 to 7.3 while the target should be around pH 6.5 to 7.0 for the majority of the plants to be used in the new design. The levels of calcium, potassium, magnesium and phosphate were all in the “above optimum” range in this analysis - probably due to the repeated applications of leaf mulch over the years. The nitrogen levels were slightly below optimum with a recommended application of 35 pounds of nitrogen per acre.

Additionally, this site is not shaded and receives the full brunt of sunshine and wind in all seasons. The Herb Garden receives little supplemental watering during the growing season, but an irrigation system is installed for the outlying turf areas.

BED PREPARATION

Based on the above site assessment, it was necessary to address several areas of improvement for the successful renovation of the Herb Garden. The original outlines of the beds were retained without any major changes. Cost and maintenance issues precluded any expansion of the site.

First, the issue of improved soil drainage was tackled. The beds were first cleared of all plant material except for the witch hazels and honeysuckles. The strenuous task of double digging the beds was completed with a two-inch layer of compost added to the bottom trench to help break up the heavy clay. An additional two inches of compost and four inches of small-grained red shale screenings (1/4 inch diameter or less) were tilled into the upper layer of the soil. Digging, adding supplements and tilling raised the beds roughly twelve inches above the original level and clearly improved the drainage.

In an attempt to lower the soil pH several tenths of a point, approximately 28 pounds of sulfur pellets were tilled into the upper soil layer of the 1,500 square foot area of the beds. The recommended nitrogen supplement was supplied with the layers of compost mentioned above (compost was measured at roughly 28% total nitrogen on a previous analysis). Finally, a sprinkler head for the turf irrigation system was moved outside the Herb Garden beds. These steps should provide the soil environment most amenable to the growth of healthy herbs.

HARDSCAPE IMPROVEMENTS

Most visitors walk through this area exiting or entering the Rose Garden. Though these beds were always intended for viewing from all sides, the only paved path runs right through the middle of the garden. The original access paths to the outer edges of the Herb Garden were simple rectangular bluestone pavers crossing the “waist” of the beds. These were quite narrow and would become overgrown and obscured by the sprawling herbs by mid-summer.

In order to draw the visitor toward the outside areas of the Herb Garden, these paths were widened to 48 inches and paved with irregular bluestone flags (1.5 inches thick). Laid on a base of red screenings, these contrasting colors and patterns created a pleasant walkway with sufficient space for plantings of creeping herbs between the stones. The paths themselves will become part of the display while drawing the visitor out toward the previously underutilized areas of the garden.

Additional interest was added with bluestone-paved quarter-circles laid where these side paths meet the main asphalt walkway. Large decorative pots placed here allow for the display of tender or aggressive herbs, such as lemon grass or mints, and the International Herb Association's "Herb of the Year" can be highlighted here each year.

RENOVATION DESIGN

Certain elements from the original 1995 design were retained out of necessity and as cost-saving measures. As mentioned previously, the witch hazels and honeysuckles in the upper beds were untouched while all other plant material was removed. The bed outlines, iron columns, main path, stairs and landings were also unchanged.

Three main challenges were addressed in creating a new design for the Herb Garden. First, every effort was made to add and extend seasonal interest with plant choices, use of color, bloom times, height, foliage size, texture and shape. Second, we tried to keep future maintenance simple and inexpensive. Third, we wanted to increase the educational value with more plant labels and informational signage.

Needless to say, the plant palette for a medicinal Herb Garden is enormous. Everything from dandelions to willow trees were considered for the design. In the end, the unexpected or unusual ornamental qualities of some plants were balanced with the traditional plants one would expect in a display of herbs. After all, it is important for visitors to quickly recognize this as an Herb Garden. Exhibiting the typical lavender, thyme, basil, rosemary and other easily recognized herbs is essential, but much interest can be added with the less familiar or unexpected herbs such as gas plant, sea holly and skullcap.

An effort was made to provide extended color through all the growing seasons. Spring finds flushes of blooms in the witch hazels, lungworts, hellebores, dwarf broom, dianthus, catmint, and selected alliums. Summer is the richest source of color as foliage and blooms burst forth on everything from the purple elders, cotton lavenders, and catmint to the salvias, thymes and geraniums. As these plants fade away, the asters, goldenrods, soapworts, and crocus species provide another flush of intense autumn color. Evergreens such as boxwoods and junipers along with the framework provided by witch hazels, elders, and echinacea add structural interest in the winter.

Much of the interest in an Herb Garden lies in the contrasting qualities of the foliage. Plant height, color, texture, size and shape have been mixed and contrasted throughout the beds. Irregularly shaped groupings of herbs, specimen plantings, repetition along the main axis and vertical accents all serve to highlight the ornamental qualities of the plants while providing interest, rhythm and balance.

Keeping future maintenance simple involved minimizing invasive plants and choosing a majority of perennial herbs hardy enough to survive the cold, wet winters and hot, humid summers. The annuals requiring protected overwintering, propagation or replacement are concentrated in certain areas for ease of management. Reference guides will also streamline maintenance by providing detailed information to the gardeners for seasonal care.

Finally, additional updated signage will give the visitor more medicinal and historical information about herbs. Examples of the new labels are found in the appendix D. The large sign at the base of the garden will be re-designed with information specifically relevant to the Herb Garden.

HERB GARDEN DEFINITION AND MAINTENANCE

The Morris Arboretum Herb Garden is dedicated to the cultivation and display of a large variety of plants used for their medicinal benefits, culinary flavorings, fragrances, and dyes. The purpose of this garden is to provide the public with an interesting exhibition of herbal plants with information designed to inform and educate the visitor about herbs. The choice and maintenance of plants should promote continuity of the design while preserving the balance between interest and education.

The following steps should facilitate the proper maintenance the Herb Garden:

- Gardeners should consult with the Rose Garden Section Leader whenever a plant is removed, moved or replaced. Plants that fail due to lack of hardiness, disease, invasiveness, inappropriate placement or rank habit should be replaced with due consideration to the original intent of the design.
- In choosing plants, the emphasis for this garden is placed on those with a history of use as medicines and herbal remedies. In some cases, a species, cultivar or variety with more ornamental qualities is chosen over a less desirable plant with a more extensive herbal history. This is necessary to improve seasonal interest or maintain the aesthetic qualities of the design.
- Important maintenance actions and decisions should be listed in the reference guide for that garden quadrant. Gardeners should refer to the appropriate guide whenever work is done in that quadrant.
- The number of tender perennials and annuals that need to be overwintered in the greenhouse, replaced or propagated each year has been kept to a minimum in this design. This needs to be continued to efficiently utilize resources and greenhouse space. Again, the Herb Garden reference guides contain the lists and schedules for these plants.

CONCLUSION

Periodically, all garden designs require reassessment to maintain their worth to the mission and goals of the institution. Eight years after the installation of the Morris Arboretum Herb Garden it was apparent the area required a major overhaul to bring balance back to the design and add interest and educational value for visitors. Improving and adjusting the soil environment, upgrading the paths, increasing the information provided with additional signage, and installing a fresh design emphasizing the ornamental qualities of herbs suited to this site and the Philadelphia climate all provide a strong foundation for the renovated garden. An Herb Garden definition and reference guides will provide a framework for future care and maintenance decisions allowing this design to be sustained over a prolonged period of time.

ACKNOWLEDGEMENTS

These projects are always a group effort. I would like to thank the staff at the Morris Arboretum for their time, advice and aide, especially Mike Tuszynski, Bob Gutowski, Debbie Caraher, and Bob Anderson. My education in herbs was not possible without the patient tutelage of Jenny Carey, Betsy Slattery and Elizabeth Kennel of the Herb Society of Philadelphia.

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APPENDIX A

Master Plant List:

<u>Plant #</u>	<u>Plant Name / Common Name</u>
1	<i>Achillea millefolium</i> 'Orange Queen' / Yarrow
2	<i>Aconitum cammarum</i> 'Bicolor' / Monkshood
3	<i>Ajuga reptans</i> 'Jungle Beauty' / Bugleweed
4	<i>Alchemilla mollis</i> / Lady's Mantle
5	<i>Allium albopilosum</i> / Star of Persia
6	<i>Allium flavum</i> / Small Yellow Onion
7	<i>Allium</i> 'Gladiator' / Gladiator Allium
8	<i>Allium pulchellum</i> / Keeled Garlic
9	<i>Allium sativum</i> / Garlic
10	<i>Allium tuberosum</i> / Garlic Chives
11	<i>Agastache foeniculum</i> 'Golden Jubilee' / Anise Hyssop
12	<i>Artemisia dranunculus</i> / French Tarragon
13	<i>Artemisia schmidtiana</i> 'Silver Mound' / Silver Mound Wormwood
14	<i>Artemisia vulgaris</i> 'Oriental Limelight' / Artemisia
15	<i>Asclepias tuberosa</i> / Butterfly Milkweed
16	<i>Aster nova-angliae</i> 'Purple Dome' / Aster
17	<i>Baptisia</i> 'Purple Smoke' / False Indigo
18	<i>Buxus sempervirens</i> 'Green Mound' / Boxwood
19	<i>Catharanthus roseus</i> / Periwinkle
20	<i>Centaurea montana</i> 'Gold Bullion' / Cornflower
21	<i>Chamaemelum nobile</i> / Roman Chamomile
22	<i>Colchicum autumnale</i> 'Waterlily' / Autumn Crocus
23	<i>Coriandrum sativum</i> / Cilantro
24	<i>Crocus sativus</i> / Saffron crocus
25	<i>Cymbopogon citratus</i> / Lemon Grass
26	<i>Dianthus gratianopolitanus</i> 'Bath's Pink' / Dianthus
27	<i>Dianthus</i> 'Greystone' / Dianthus
28	<i>Dictamnus albus</i> / Gas Plant
29	<i>Digitalis grandiflora</i> 'Carillon' / Yellow Foxglove
30	<i>Digitalis x mertonensis</i> / Foxglove
31	<i>Echinacea purpurea</i> 'Magnus' / Purple Coneflower
32	<i>Eryngium planum</i> / Sea Holly
33	<i>Galium odoratum</i> / Sweet Woodruff
34	<i>Genista lydia</i> / Hardy Dwarf Broom
35	<i>Geranium</i> 'Dilys' / Cranesbill
36	<i>Geranium</i> x 'Orion' / Cranesbill
37	<i>Hamamelis mollis</i> 'Princeton Gold' / Witch hazel
38	<i>Helleborus</i> sp. / Hellebores
39	<i>Humulus lupulus</i> 'Aureus' / Golden hops
40	<i>Hyssopus officinalis</i> / Hyssop
41	<i>Juniperus communis</i> 'Pencil Point' / Pencil Point Juniper
42	<i>Lavandula angustifolia</i> 'Hidcote' / Lavender
43	<i>Lippia dulcis</i> / Lippia
44	<i>Lonicera sempervirens</i> 'Alabama Crimson' / Honeysuckle
45	<i>Marrubium vulgare</i> / Horehound
46	<i>Mentha pulegium</i> / Pennyroyal
47	<i>Mentha x piperita</i> 'Chocolate' / Chocolate Mint
48	<i>Monarda didyma</i> 'Raspberry Wine' / Bee Balm
49	<i>Nepeta</i> 'Joanna Reed' / Catmint
50	<i>Ocimum americanum</i> 'Lime' / Lime Basil
51	<i>Ocimum basilicum</i> 'African Blue Variegated' / African Blue Basil
52	<i>Ocimum basilicum</i> 'Cinnamon' / Cinnamon Basil

APPENDIX A cont.

Master Plant List:

- 53 *Ocimum basilicum* 'Magical Michael' / Magical Michael Basil
- 54 *Ocimum basilicum* 'Mrs. Burns' Lemon' / Lemon Basil
- 55 *Ocimum basilicum* 'Purple Ruffles' / Purple Ruffles Basil
- 56 *Ocimum basilicum* sp. / Columnar Basil
- 57 *Ocimum basilicum* 'Spicy Globe' / Spicy Globe Basil
- 58 *Origanum rotundifolium* 'Kent Beauty' / Kent Beauty Oregano
- 59 *Origanum laevigatum* 'Herrenhausen' / Herrenhausen Oregano
- 60 *Origanum libanoticum* / Cascading Oregano
- 61 *Origanum* 'Silver Anniversary' / Silver Anniversary Oregano
- 62 *Origanum vulgare* 'Aureum' / Golden Oregano
- 63 *Paeonia* 'Ivory Jewel' / Ivory Jewel Peony
- 64 *Perovskia atriplicifolia* 'Little Spire' / Russian Sage
- 65 *Plectranthus amboinicus* 'Well-Sweep Wedgewood' / Cuban Oregano
- 66 *Pulmonaria* sp. / Lungwort
- 67 *Rosmarinus officinalis* 'Sawyer's Select' / Rosemary
- 68 *Ruta graveolens* 'Jackman's Blue' / Rue
- 69 *Salvia blepharophylla* 'Diablo' / Eyelash Leaved Sage
- 70 *Salvia elegans* / Pineapple Sage
- 71 *Salvia greggii* 'Wild Thing' / Autumn Sage
- 72 *Salvia microphylla* 'San Carlos Festival' / Little Leaf Sage
- 73 *Salvia officinalis* 'Aurea' / Golden Sage
- 74 *Salvia officinalis* 'Berggarten' / Berggarten Salvia
- 75 *Salvia officinalis* 'Compacta' / Dwarf Sage
- 76 *Salvia officinalis* 'Purpurascens' / Purple Sage
- 77 *Salvia sylvestris* 'Blue Hill' / Blue Hill Salvia
- 78 *Salvia uliginosa* / Bog Sage
- 79 *Salvia verticillata* 'Purple Rain' / Purple Rain Salvia
- 80 *Sambucus nigra* 'Thundercloud' / Purple Elder
- 81 *Sanguisorba tenuifolia* 'Purpurea' / Japanese Burnet
- 82 *Santolina chamaecyparissus* 'Incana' / Lavender Cotton
- 83 *Santolina chamaecyparissus* 'Pretty Carroll' / Lavender Cotton
- 84 *Saponaria lempergii* 'Max Frei' / Soapwort
- 85 *Satureja montana* / Creeping Winter Savory
- 86 *Scutellaria x* 'Violet Cloud' / Violet Cloud Scullcap
- 87 *Solidago sphacelata* 'Golden Fleece' / Goldenrod
- 88 *Spilanthes acmella* / Toothache plant
- 89 *Stachys byzantina* 'Helene von Stein' / Lamb's ears
- 90 *Stevia rebaudiana* / Stevia
- 91 *Tanacetum parthenium* 'Aureum' / Golden Feverfew
- 92 *Teucrium chamaedrys* / Germander
- 93 *Teucrium chamaedrys* 'Summer Sunshine' / Germander
- 94 *Thymus praecox* 'Coccineus' / Red Creeping Thyme
- 95 *Thymus praecox* 'Pseudolanuginosus' / Woolly Thyme
- 96 *Thymus pulegioides* / Mother-of-Thyme
- 97 *Thymus pulegioides* 'Anderson's Gold' / Anderson's Gold Thyme
- 98 *Thymus pulegioides* 'Orange Balsam' / Orange Balsam Thyme
- 99 *Thymus serpyllum* 'Pink Chintz' / Pink Chintz Thyme
- 100 *Thymus serpyllum* var. *alba* / Wild Thyme
- 101 *Thymus vulgaris* / English Thyme
- 102 *Thymus vulgaris* 'Argenteus' / Silver Thyme
- 103 *Thymus x citriodorus* 'Aureus' / Golden Lemon Thyme
- 104 *Thymus x citriodorus* 'Lemon Frost' / Lemon Frost Thyme

105 *Viola tricolor* 'Helen Mount' / Johnny-jump-up

APPENDIX B

Budgets:

Signs & Hardware	# Needed	Price	Total
Plant Labels, 2" x 4", Style II	31	\$ 6.50	\$ 201.50
Plant Labels, 3" x 5", Style II	29	\$ 8.00	\$ 232.00
Stakes, 12"	34	\$ 3.25	\$ 110.50
Stakes, 24"	26	\$ 3.75	\$ 97.50
Screw & locknut set	60	\$ 0.75	\$ 45.00
		Total =	\$ 686.50

myplantlabel.com
 Nameplate & Panel Technology
 387 Gunderson Drive
 Carol Stream, IL 60188
 (800) 833-8397 Renee Melbourn

Plants		Total =	\$ 1,221.97
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Various vendors, see order list

Stone & Screenings			
Bluestone flags			\$ 390.00
Red screenings, 22 tons			\$ 297.89
		Total =	\$ 687.89

Horticulture Department Total = \$ 1,909.86

