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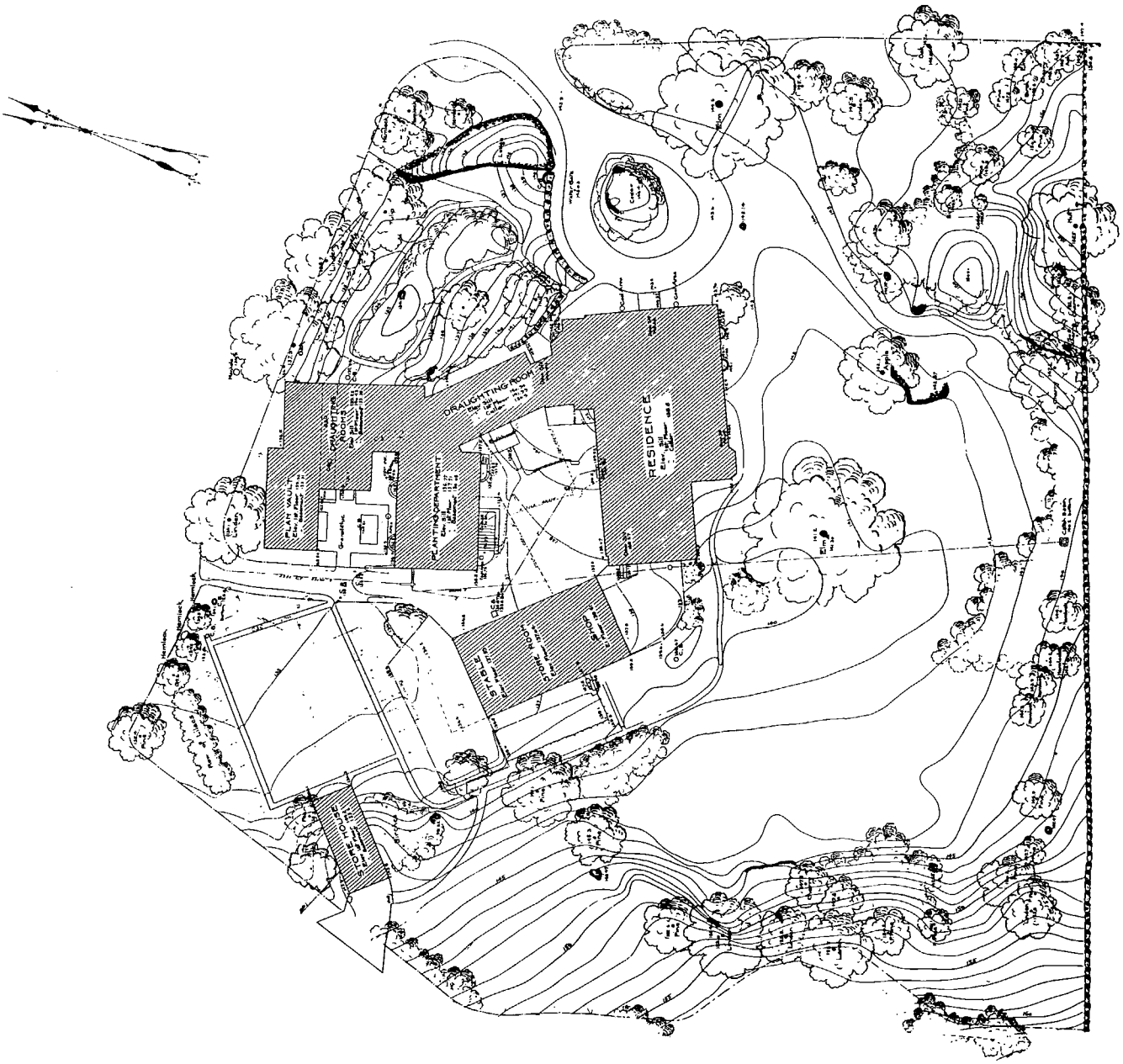

Frederick Law Olmsted National Historic Site

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HISTORIC GROUNDS REPORT

AND MANAGEMENT PLAN

FREDERICK LAW OLMSTED

NATIONAL HISTORIC SITE

BROOKLINE, MASSACHUSETTS

By Lucinda Adele Whitehill

U.S. Department of the Interior
National Park Service, North Atlantic Region

1982

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PREFACE

This report was funded by the Office of Scientific Studies, North Atlantic Regional Office, National Park Service, Boston, Massachusetts.

Many individuals were instrumental in the preparation of this document. I am grateful to the staff of the Frederick Law Olmsted National Historic Site for their technical assistance and their moral support. I'd like to especially thank Irene Laffey for her typing efforts, Mary Tynan for her research assistance, Ray Hernandez, Andy Daniels and Bob Galvin for their work on the grounds stabilization activities, and Shary Page Berg for her time spent in editing and review. All of the historic photographs in this report were prepared by Donald Linne of the Northeast Document Conservation Center, Andover, Mass. Angela Giral of the Harvard Graduate School of Design Library kindly lent the John Charles Olmsted photographs of Fairsted for reproduction purposes. Horticultural assistance was provided by the staff of the Arnold Arboretum and the Suburban Experiment Station, Waltham, Mass. Without the help of these individuals, this report would not have been possible.

FOREWORD

> "the (man-made). . .landscape itself, to those who know how to read it aright, is the richest historical record we possess." Historic preservationists have always accepted the concept of preserving buildings as the essence of our heritage. Now we must work to bring the land itself to this same level of recognition.*

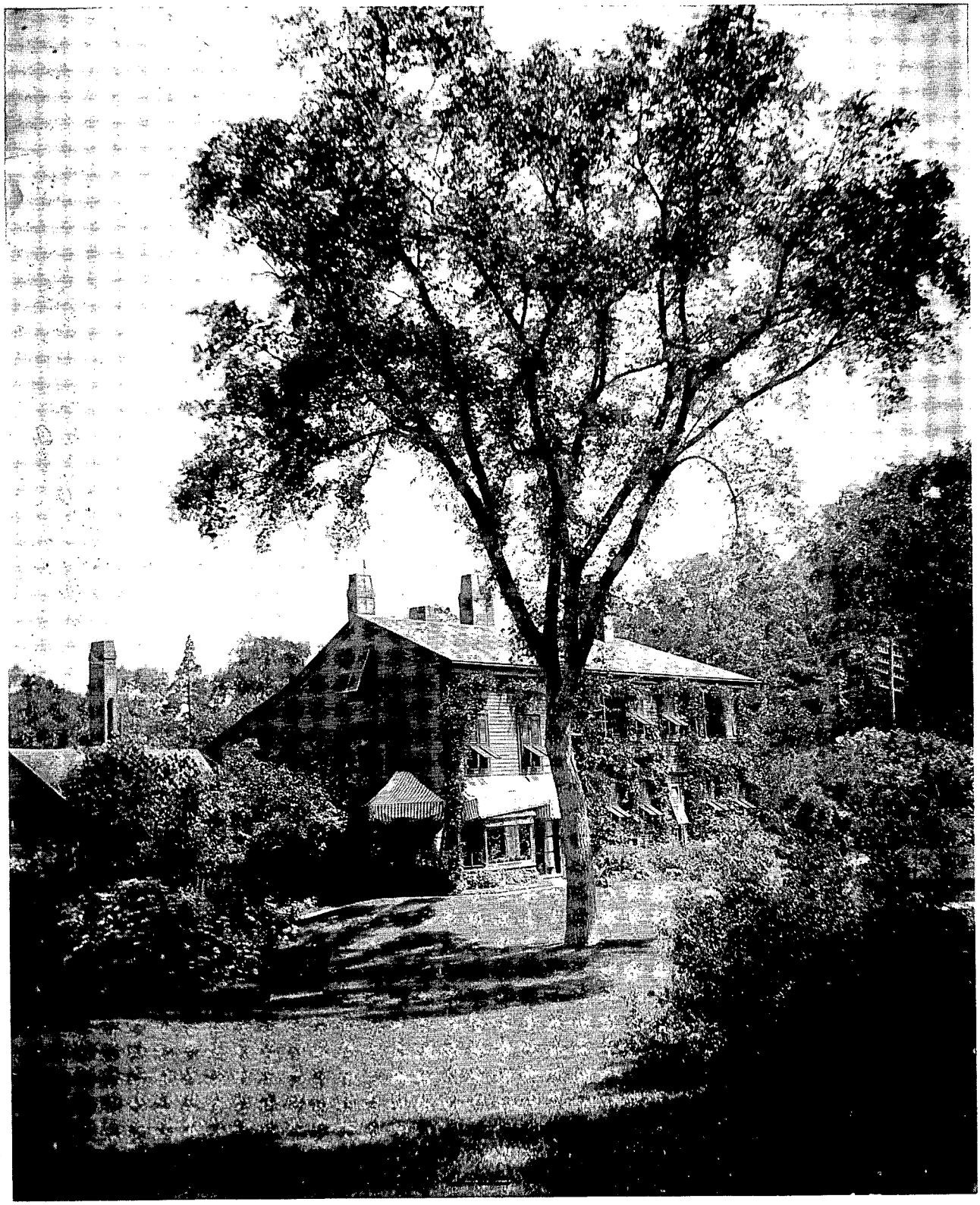
The value of preserving or restoring an historic structure is well recognized today and there are many established methods and procedures to refer to. Technical publications, preservation bulletins and professional advice are available from public agencies and private organizations on a variety of topics: structural preservation, construction techniques, mortar analysis, color research, historic furnishings, adaptive reuse, etc. Until recently, the historic landscape has not received the same specialized attention. The work which has been done on historic grounds has generally been secondary to the preservation of an historic structure. The preservation of the landscape as an entity in itself has received minimal attention. Landscape architects and preservation professionals have recognized this imbalance and are beginning to correct the deficiency in published information, professional training and research on the historic landscape.

It was partially due to this growing interest in landscape history and preservation that Frederick Law Olmsted's home and office in Brookline, Massachusetts were designated a national historic site and acquired by the National Park Service in 1979 ". . .in order to preserve and interpret for the benefit, inspiration, and education of present and future generations. . ." (Public Law 96-87, October 12, 1979). As the 'father of landscape architecture in America,' Olmsted had enormous influence in shaping the 19th century American landscape. The site's archives document the development and practice of landscape architecture by the Olmsted family. The landscape of the site illustrates much of what was valuable in Olmsted's work. The application of his design principles are as apparent here as in his public park designs. The design changes and additions of plant material which have occurred over time create a layering of history within the landscape which parallel the development of the Olmsted firm and its landscape design philosophy.

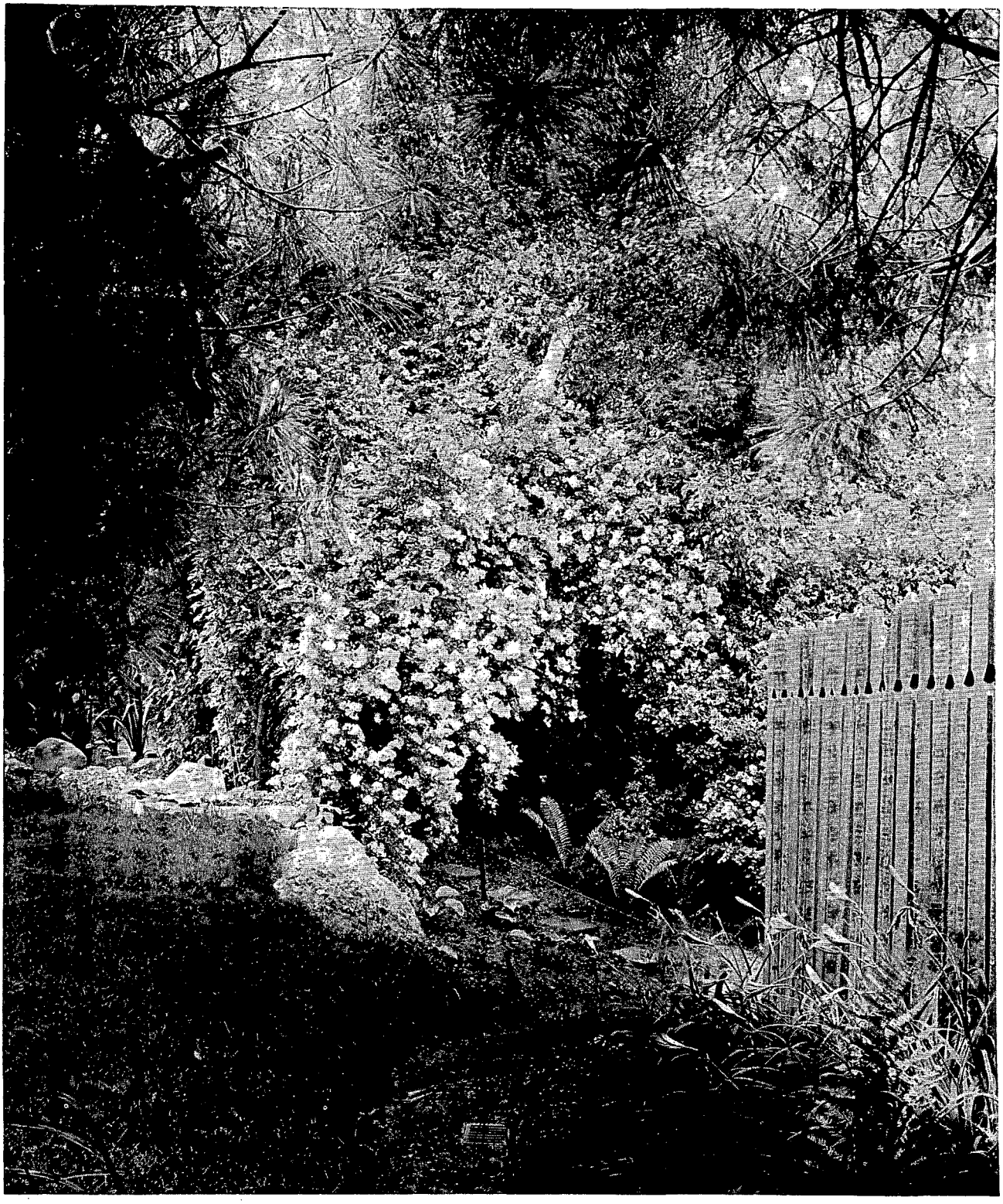
* W.G. Hoskins, The Making of the English Landscape quoted by William H. Tischler, Bulletin of the Association for Preservation Technology No. 4 1979

At 1.76 acres, the Olmsted site is small enough to be readily manageable as a preservation case study. The problems encountered here are a microcosm of what might be encountered in any landscape preservation study. For example, new terms and concepts will have to be developed in landscape preservation which may not apply to architectural preservation, especially concerning the dynamics of an ecological system and how this affects its preservation. A landscape is a fragile environment whose character changes with the time of day, the season and the years. A building can often be restored to a specific year, period or even day (the day Lincoln was shot at Ford's Theater). Added porches can be removed and the original paint color can be restored. To some extent this is true of a landscape. Overgrown plant materials can be removed and old varieties put in their place, historic maintenance techniques can be used and so on, but each year's growth on a tree or each season's development on the size of a shrub border cannot easily be checked. Death, disease and natural disaster also affect the balance of this ecological system. Even one season's growth, if not carefully monitored, can destroy the scale of a design, shade out plant species or weaken some plants until they succumb to disease. These concepts and others will affect a landscape preservation project unlike an architectural preservation plan, and therefore must be considered in this and other plans where the landscape is involved.

During the study period stabilization and preservation measures were undertaken to maintain the Olmsted landscape as it is. This 'mothballing' approach will be continued until a definitive management plan has been prepared which outlines future landscape management policies and procedures. Once such a plan is in place, full scale restoration or preservation of the grounds can begin. Many corrections can be undertaken immediately, others will take time and patience to work out. The Fairsted landscape has been in existence for many years and an 'overnight restoration' will not be possible. However, much can be done to correct problems throughout the grounds within a short time period. Severe weed infestations, pruning of shrubs and diseased trees, division of overgrown perennials and corrective measures to improve the quality of the soil can be undertaken immediately. Restoration of proper design scale and replacement of lost plant species will take 3-4 years or more before the plant material fits into place.



No Date. South Lawn. View Northeast. Note path pattern and plantings where pool and terrace currently stand.



No Date. Rear Lawn. View North area just south of storage shed. This photo shows the variety of plant material and naturalists design which once dominated the site. None of the plants shown in this photo remain.

I. Introduction

A. PURPOSE AND SCOPE

Research for this report was begun in May 1981 with the following goals in mind:

- to gain a thorough understanding of the history and significance of the grounds prior to beginning any major physical work.
- to prepare a comprehensive visual and written documentation of current site conditions to be used as a benchmark for future research and study.
- to identify major resource management problems and to develop strategies for dealing with them.
- to identify issues and opportunities related to the landscape for consideration in overall planning and development.
- to document the process of research, analysis and preservation for our own records and for use as an educational tool and a prototype landscape preservation project.
- to project accurate costs and staffing needs for grounds rehabilitation and maintenance and to provide resource information to assist the park gardener in this effort.

This Historic Grounds Report and Management Plan will serve as a resource management and planning document for the Frederick Law Olmsted National Historic Site. It provides detailed information concerning the history, current conditions and future management alternatives for the landscape at Fairsted. Its purpose is to collect and analyze past and present site conditions, to develop recommendations for maintenance and preservation, and to raise issues related to long term planning.

It is one of several study reports which will be prepared for the site. A draft Historic Resource Study has already been prepared which provides an overview of the history of the site and contains general information concerning the structures, the landscape and the people associated with the Olmsted property. An Historic Structures Report will provide an in-depth analysis of the structural portions of Fairsted: the house, the office, outbuildings and fences to guide in their preservation and rehabilitation. The various research documents, combined with community input and other data, will ultimately result in a General Management Plan which will guide the overall development of the site.

B. STUDY PROCESS

This report is the result of a comprehensive study of the history and present conditions of the grounds of the Frederick Law Olmsted National Historic Site. The work was performed by a horticulturist with a strong background in historic preservation. The study approach was based on detailed observations of the current landscape and extensive archival research. Major points of this process are outlined as follows:

1. General orientation. Develop schedule, outline and study approach. Preliminary review of historical data. Prepare base maps.

2. Plant identification. Identify and map all plant materials. Begin photographic inventory of plant materials and landscape views to be carried on throughout the year. Identify disease and pest problems. Establish contacts with resource people such as the Arnold Arboretum and the University of Massachusetts Suburban Experiment Station.

3. Historical research. Review published data and then begin detailed look at plans, photographs, plant lists, correspondence, financial records, deeds and other pertinent data.

4. Recommendations. Use horticultural and historical information to develop a list of issues and recommendations. Work with gardener to explore options for dealing with most severe problems and to develop work schedule. Work with park ranger to explore how study data can be used in educational and interpretive programs.

5. Draft report. Research issues requiring additional attention such as use of pesticides. Develop slide program and graphics to accompany final report.

6. Final report. Implement management recommendations and integrate study data into interpretive program.

All historical references in this report are based on photographs, written material, and plans in the Olmsted archives at the Olmsted National Historic Site and the collections of the Frances Loeb Library at the Harvard Graduate School of Design. Maps of the entire estate for 1883, 1887, 1904 and 1955 were useful for identification of large trees and some shrubbery, but the majority of plants were not indicated. A 1904 map with notations made by Hans Koehler in 1910-11 was useful for determining plant material and planned changes for the estate in 1910. Maps of specific areas proved to be the most useful, i.e. landscape plans for the hollow, rock garden, rear courtyard etc. These plans indicate when major changes occurred on the site. A list of all plans concerning the landscape at Fairsted can be found in the appendices of this report. Planting lists for Fairsted, on file at the Olmsted NHS, identified species ordered for the grounds at various times (often to accompany a landscape plan) but without details illustrated on the plans, one cannot tell where these species were used.

Photographs for the early years (1885-1887) are available from the John Charles Olmsted Collection, Frances Loeb Library, Harvard University. These photographs do not identify plant material, and some are not dated, but they are the

only primary source available for the changes made by Frederick Law Olmsted, Sr. The photograph archives of the Frederick Law Olmsted National Historic Site document changes made after 1904, especially the years 1904-1920's. Few photographs were taken from 1930-1960. The Richardsons, the last family to occupy the house before the Park Service, took photos of the south lawn, rear courtyard and hollow during the 1960's. The photographic records are by no means complete, as some areas of the property were more popular to photograph than others.

Evaluation of current conditions was drawn from on-site investigation and from information provided by the Arnold Arboretum, the Suburban Experiment Station, the Massachusetts Department of Agriculture and Mr. Joseph Hudak (formerly of Olmsted Associates). A fairly complete photographic record of all portions of the property was made to accompany this report. These slides illustrate the change of seasons at Fairsted; the flowering, fruiting and growth characteristics of many plants and any rejuvenation efforts begun during the project period. Photographs of existing plant material were taken each week of the study period with a 35mm camera equipped with a 50mm lens. For some areas a 28mm wide angle lens was used. Reproductions of historic photographs and plans were accomplished with the help of the Northeast Document Conservation Center.

For the purposes of this report, 'landscape' is defined as including all land, water, trees, shrubs, other vegetation and plant materials, landforms, roads, paths and walkways. Though structures, including fences and the siting and placement of architectural structures, are often included in the term 'landscape', they will be treated in the Historic Structures Report and therefore have not been included in this study.

C. SIGNIFICANCE OF THE LANDSCAPE

As an historical landscape, Fairsted is associated with the life and work of Frederick Law Olmsted, Sr. from 1883-1903 and his family from 1904-1935 with later alterations attributed to the Olmsted firm up to 1979, when the Park Service took over the property.

The overall effect of the grounds is clearly an illustration of Olmstedian design principles. The property represents an example of the picturesque and naturalistic (i.e. pastoral) style of landscape design which Olmsted employed. Though the plant material and, to some extent, the overall designs have been altered by nature and man throughout the property's history, the effect and serenity of the naturalistic design has not changed (with the exception of the terrace and swimming pool addition of the 1960's).

Historically, the property was a form of experimental garden for new plant materials. The landscape architects working in the office were often affected by the plant materials and designs found around them, in particular 'the hollow', which sat directly east of the drafting office windows. Though it is difficult to measure what effect the plantings had on the landscape architects, they undoubtedly did have an influence, albeit an unconscious one. It is these men, who, in turn, designed further projects throughout the United States, both large and small, with similar design intentions.

Some of the plant material existing on the property is significant for its size, age and rarity within the area. For example the cucumber magnolias are believed to have been planted by F.L. Olmsted, Sr. the same time as those at the Arnold Arboretum. The 'Olmsted elm', a specimen planting in the south lawn, continues to receive special pruning and spray controls for Dutch elm disease. This tree is significant not only for its age and size, but for its good health in an area where Dutch elm disease has taken its toll. A large specimen of Pyracantha coccinea can be found thriving along the shrub border south of the house. This plant is rare, as most pyracantha grown today are the cultivar 'Lalandei'. Other plant species grown about the property are equally significant.

The significance of this landscape, therefore, can be measured on a variety of levels: 1) as an example of Olmstedian landscape design; 2) as a design which influenced other landscape design plans; 3) as the site where F.L. Olmsted and his family lived and worked; and 4) for the fine specimens of plant material found throughout the grounds.

II. History

A. OLMSTED'S THEORIES OF DESIGN

To appreciate the landscape at Fairsted, it is necessary to understand how Olmsted approached the profession which he named landscape architecture. Frederick Law Olmsted's design theories were molded long before he became a practicing landscape architect. From the time Olmsted was very young he toured the countryside of New England and upper New York State with his father, on horseback, in 'search of the picturesque'.(1) As Olmsted acknowledged later "The root of all my work has been an early respect for and enjoyment of scenery, and extraordinary opportunities for cultivating susceptibility to its wonderful power."(2)

Later, this early appreciation of aesthetics in the American landscape was supplemented by the writings of Uvedale Price (An Essay on the Picturesque, 1794), William Gilpin (Remarks on Forest Scenery, and Other Woodland Views, 1790) and Humphrey Repton (Sketches and Hints on Landscape Gardening, and The Theory and Practice of Landscape Gardening)—all writers of the late 18th century English landscape school. In addition, two 18th century writers, Johann Georg von Zimmerman and Horace Bushnell strongly influenced Olmsted's theories on the powerful effects of scenery. Olmsted theorized "Scenery works by an unconscious process to produce a realizing and unbending of faculties made tense by the strain, noise and artificial surroundings of urban life."(3)

The horticultural revolution of the early 19th century led gardeners to reject older theories of landscape design and concentrate on displaying the latest and largest number of the new horticultural introductions in fanciful Victorian designs. Olmsted rejected this fashion for the unusual, preferring instead the natural beauty of the English landscape school. "Gradually and silently," wrote Olmsted, "the charm comes over us; we know not exactly where or how." The effect was subtle and refrained expression: "Dame Nature is a gentlewoman, no guides fee will obtain you her favor, no abrupt demand, hardly will she bear questioning, or direct curious gazing at her beauty."(4)

Charles Beveridge, scholar and editor of the Olmsted Papers, outlines Olmsted's design principles as the 6S's: scenery, suitability, sanitation, subordination, separation and spaciousness.

a. Scenery

Olmsted utilized two forms of the English landscape school - the sense of the Beautiful (or the Pastoral) and the Picturesque. The 'Pastoral' ideal was used to create a sense of the peacefulness of nature, to soothe and restore the spirit. In such designs there were broad spaces of greensward, broken occasionally by groves of trees. The boundary was indistinct, due to the obscurity of detail further away produced by the uneven line and intricate foliage of the trees on the edge of the open space.(5) This use of the pastoral can immediately be appreciated in the Olmsted and Vaux design for "The Long Meadow" in Prospect Park. The Picturesque ideal was used to create a sense of mystery, variety and diversity as one moved about a space. Olmsted introduced "complexity of light and shadow near the eye to heighten nature's mystery and bounty."(6) He used such techniques as variety of form and texture and variety of hues, to create a constantly changing interplay of light and shadow. He often planted profusely using ground-covers, shrubs, trees and vines to create a layering of bounty. Many times he added creepers and vines to the trunks of deciduous trees to add winter greenery. His use of plant material included native and introduced species. He could thus enhance the natural scenery by using any plant which did not appear as unnatural or exotic.(7)

b. Suitability

Olmsted believed that service precedes art. That is, no element, organic or inorganic should be presented strictly for ornament without also providing some utility of purpose. Further, he rarely changed the topography or design of the land unless absolutely necessary. He believed Alexander Pope's statement to the Earl of Burlington to "consult the genius of the place in it all."(8) His designs therefore were suited to each site's individual topography.

c. Sanitation

By combining such skills of engineering as water drainage, road bed design and diversion of polluted waters, Olmsted sought a design which was healthful and sanitary, both physically and mentally. His plan for Boston's Muddy River was commissioned to turn the area from a breeding ground for mosquitos and disease into a healthy, beautiful place for strolling and personal enjoyment. It was believed that not only the physical aspects of the river would be healthier, but that the created scenery would benefit one's mental health as well. Many of his parks were designed with the 'restorative' powers of scenery in mind.

d. Subordination

As a companion to suitability, this principle dictated that no element of the design superimpose itself on the intent of the whole; each part should add up to something greater than the sum of its parts. This principle included all elements: plant material, topography, rock outcroppings, paths and garden structures. In his designs, all were as "warp and woof in a brocade."(9)

e. Separation

Olmsted strove for separation of styles and separation of uses. He separated formal, naturalistic, picturesque and pastoral designed areas so that one would not overwhelm or compete with another. His pathways were laid so that pedestrian and vehicular traffic did not compete with each other. Often his service areas were set apart so as to not interfere with visitors. This principle is best exemplified by the transverse roads in Central Park, where vehicular traffic was separated from the pedestrian traffic by bridges. In this way the park could be fully enjoyed without the interference of cross-town traffic.

f. Spaciousness

No matter what the size of the space, Olmsted sought to create a perspective effect within the design. By contrasting dark foregound elements with lighter, less distinct elements further away, the complexity of light and shadow near the eyes and obscurity of detail further away heightened the perspectives and rendered the desired effect. Often area boundaries were planted with an abundance of plants in irregular lines. This obscured the edges and made the area appear larger than it was.

These six principles were illustrated in the design of Fairsted, as they were in all of his designs, both public and private. Even today, one feels the subtle, natural beauty of the Fairsted landscape. Native plant material is intermingled with introduced and cultivated species, yet each blends with the other, creating a rich profusion of color, form and texture.

The sense of the Beautiful, or Pastoral, is best illustrated in his design for the south lawn. This large expanse of grass, with undulating lines of shrubbery concealing the boundary, reflects the same design ideas he first introduced with his 'Greensward' plan for Central Park in 1858. The interplay of form, texture and color found in the border plantings and rock garden area and the layering of plant material heighten the viewer's sense of the bounteousness of nature.

Olmsted's picturesque and spatial ideals are illustrated in the hollow, or sunken garden, located in the northeast corner of the property. This tiny area has been redesigned numerous times, but the variations in form, texture and color create interesting and varied views as one moves about the space. These variations also create the illusion of a larger space than the actual dimensions would indicate.

Olmsted's separation of styles and uses is illustrated quite clearly in the design of Fairsted. The hollow and the south lawn are separated by a carriage turn which provides an intermediate element between the picturesque hollow and the pastoral south lawn. A service entrance was designed off Dudley Street. This confined the delivery entrance, stable areas and service yard to the rear (northwest) corner of the property, separate and unseen from the pleasure grounds.

Native, introduced and cultivated 'test' varieties of plants were established along the west border of the property. The combination of plant material appears as spontaneous and naturalistic as a virgin woodland. The border effectively screens the adjoining property and street from view. The irregular massing and variation in plant material create the feeling of spaciousness that Olmsted desired. Often seedlings from this area have been used to replace lost plant material in less secluded parts of the estate.(10)

As time passed and the first plantings at Fairsted matured, some changes were necessary to maintain the original design and to prevent an overgrown and unkempt appearance. As Olmsted's sons and later members of the Olmsted firm became responsible for the upkeep of Fairsted, each landscape architect dealt with this 'naturalistic style' in his own way, as variations on a theme.

John Charles Olmsted, writing to his wife, Sophia in 1899 expresses the difficulty in creating the naturalistic style:

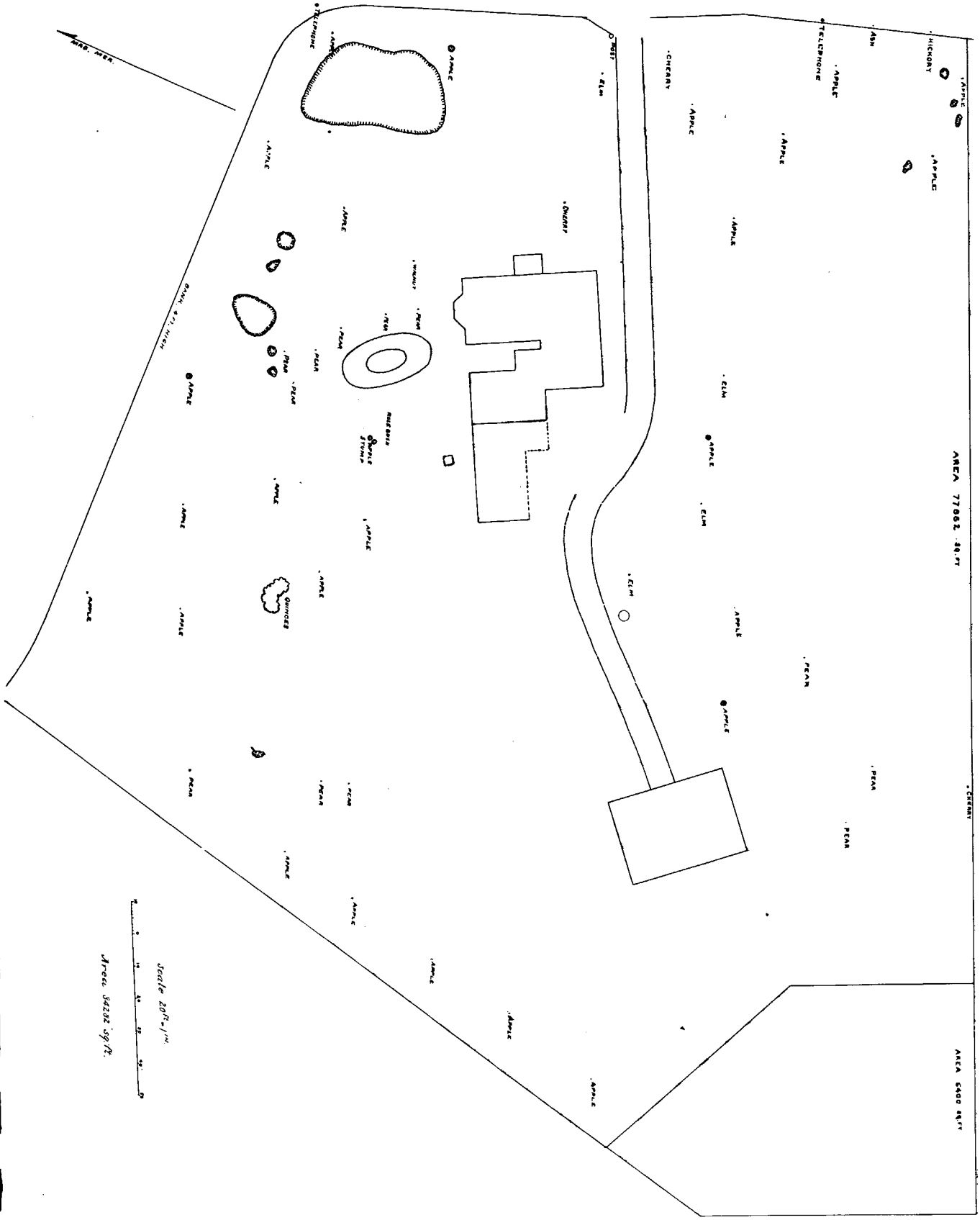
> The aim, then, is to take a woodland as the type, but to make it more striking, handsome, and humanized. It is to be recognized as the work of man. It is to be no more a realistic creation than an oil painting of a waterfall or a sunset scene is. It is a difficult scheme to accomplish satisfactorily, just as it is difficult for an actor to simulate the stronger passions of human life.(11)

Despite years of change, Fairsted retains the picturesque qualities of the original design. The property now illustrates another principle of design: the layering of history. Just as Olmsted encouraged a layering of plant material to illustrate the bounteousness of nature, the evolution of Fairsted has produced a successive layering of plant material from various time periods in the property's history. This successful interweave of change creates a 'living record' of history which must be interpreted as delicately as the changes in the historic structures.

B. MAJOR PERIODS

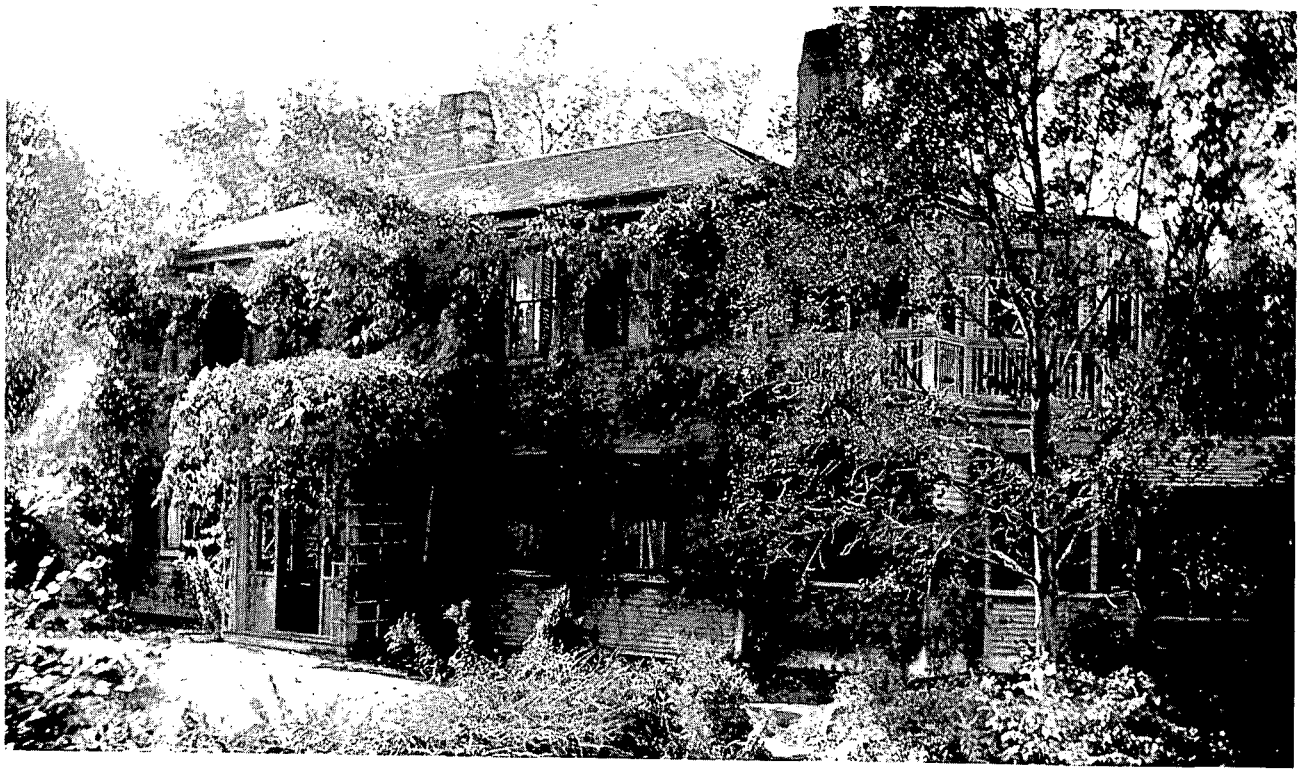
1. Prior to 1883

Early atlas maps for the town of Brookline indicate that the lot at the corner of Warren and Dudley Streets was settled by Dudley Boylston in 1722. The land was cleared and developed as a small farm, as were most of the properties in the area. After Dudley Boylston's death in 1748, the farm passed to his son, Joshua Boylston. In 1804 the farm was inherited by Joshua's daughter, Rebecca, who married Joshua Clark in 1810. At this time the old house was taken down and a new one, designed by Nathaniel Murdock, was constructed in its place. The property was later inherited by Joshua and Rebecca Clark's two daughters.(12) Gradually the emphasis in land use changed from farm fields to orchards. At the time Olmsted came to the property, apple, pear and cherry trees surrounded the house and the barn.


MAG. MER.
TELEPHONE
APPLE
POST
ELM
CHERRY
HICKORY
ASH
WALNUT
PEAR
RASPBERRY
STUMP
QUINCES
AREA 77862 SQ.FT
AREA 6400 SQ.FT
Scale 20ft = 1in.
Area 84282 sq.ft.

1883 Plan

c. 1883. Fairsted. View East, taken prior to the barn being moved from the hill. Note open, farmlike appearance of the estate. Photo courtesy Frances Loeb Library, Harvard University.



c. 1904. East Facade of House from across the hollow.

The Shurcliff family rented the property from the Clark sisters during the summer of 1873. Arthur Shurcliff, a son, later came to work for the Olmsted firm. He describes the area that summer of 1873:

> The comforts of the home, the novelty of the long grape arbor attached to the south side of the house, the steepness of the sunny rolling hillside, the shade of great trees, the fragrant hay of the horse and cow barn, and the curious winding rock-sided ravine which lay between the house and the street will never be forgotten. On the borders of that ravine stood a crabapple tree whose September windfalls of yellow fruit seemed to me an astonishing wonder. Every morning I went with my brothers to buy milk from the nearby Atkinson farm which lay in the midst of great fields, pastures, woodland, ponds and farmsteads set widely apart on narrow winding steep streets and lanes.(13)

- -

From 1870 to 1880, Frederick Law Olmsted's responsibilities in the Boston area steadily increased. By 1878 his family was spending summers in the area and winters in their New York townhouse. By 1881 Olmsted was ready to make Brookline his permanent home. Between 1881 and 1883 he rented two homes, one on Walnut Street, the other on Dudley Street along the Brookline Reservoir. While in the second home, he became familiar with the Boylston-Clark property.(14)

Olmsted fell in love with the picturesque qualities of the Clark farm. The property sloped up to a hillside at the west and sloped gently downward to the north across the front. The house and barn were set back from the road, surrounded by fruit trees. At the northeast corner of the property was a rocky dell filled with large outcroppings of Roxbury puddingstone. Olmsted recognized the value of the site immediately and hoped to persuade the Clark sisters to sell. At first they were unwilling to part with their ancestral home. Then, John Charles Olmsted designed a cottage on the property in which the two could live, with the mortgage payments from the sale of the property as a living allowance. The Clark sisters agreed to sell, the cottage was constructed, and F.L. Olmsted and his family moved into the house in 1883.(15)

John Charles spoke of the sale of the property in a letter to his new wife, Sophia, on June 4th, 1899:

> But I confess to a little vague fear that in buying land for our permanent house we may have to pay an exorbitant price as compared with the land values that prevailed at the time my father bought his Brookline house and land. That lot of nearly two acres and house and barn cost $13,200, or 13¢ a foot including improvements then on the land. He then spent about $4,000 on the house and $4,000 on the land and barn making the cost $21,200 in all. Of course some more has been spent in improvements since aside from the office addition which is another matter.(16)

2. Olmsted Sr. 1883 - 1903

Photographs taken by John Charles early in the Olmsteds' residence show a gradual disappearance of the farm-like qualities of the property to a more picturesque residence. The barn was moved to a position northwest of the house when the cottage was built. Fences were added which surrounded the service yards about the barn, screening them from the view of the rest of the grounds.(17)

The only topographical change which occurred during this period was the addition of a carriage turn on the east side of the house. Olmsted built a stone retaining wall by the 'hollow' or dell which fell away at the northeast corner. The slope was filled in from the south to this wall, creating a large flat area directly in front of the residence. Here, a circular turn was constructed with a low hillock in the center. Two entrances led in from Warren Street. At the northerly entrance an archway was built; the southerly entrance was a pedestrian path, accessible by a gate in the fence. The low hillock in the center of the drive was planted with deciduous shrubs and groundcovers with a Canadian hemlock at the center. This tree is still present today, screening the front of the house from the street.(18)

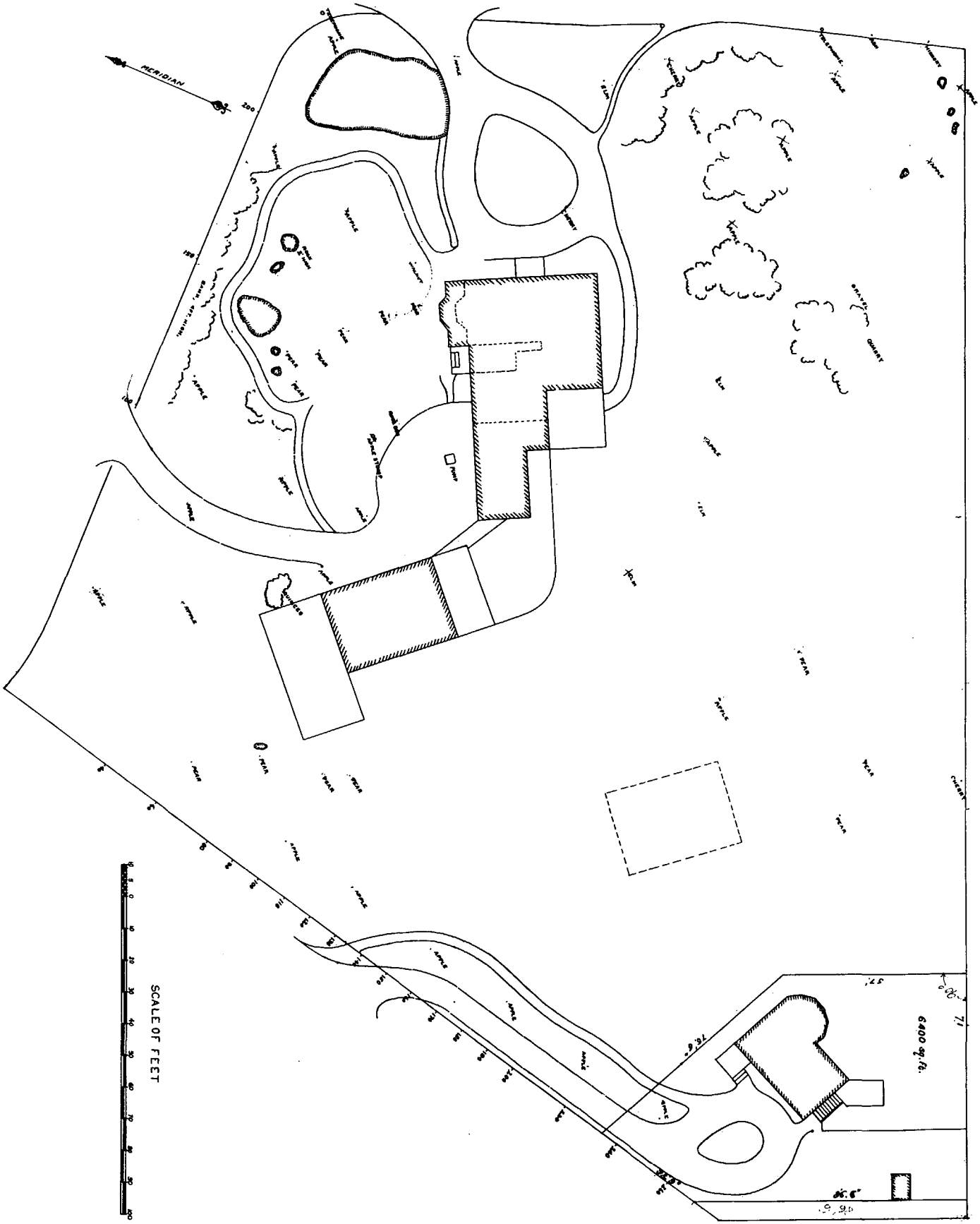
A rustic spruce pole fence was built around the perimeter of the property. From Dudley Street this fence turned into the grounds along both sides of a service driveway which led to a circular yard in front of the barn. The Warren Street driveway was considered the formal entrance to the house and grounds.(19)

Gradually the apple and pear trees gave way to perimeter plantings just inside the pole fence and along the stone wall which ran between the Olmsted property and the Gardner property to the south. The hollow was landscaped and stone steps descended the embankment just off the carriage turn to a circular path which led along the base of the hollow and out to the service driveway and side door on Dudley Street.(20) A small knoll at the southeast corner of the estate (listed on the 1887 map as a quarry) was planted with shrubs, perennials and a few trees. Known as the 'rock garden', this area has been redesigned many times.

A large amount of plant material was added to the south side of the site. As these plants matured, the stone wall became hidden, making the boundaries of the property appear indistinct. Additional plant material was added to the rear (west) bank of the property screening the view from Fairmount Street.(21)

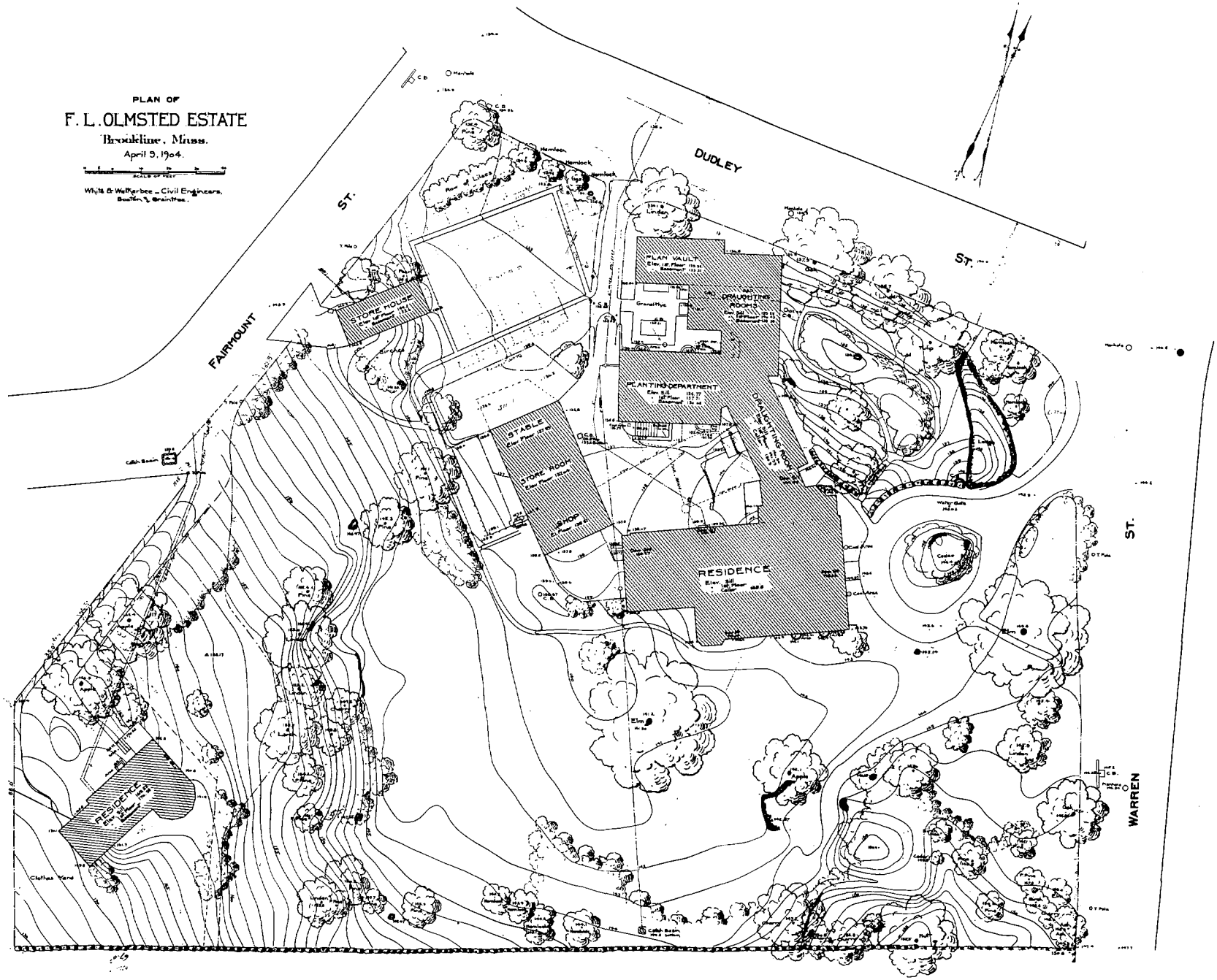
It is difficult to determine how much work Olmsted himself did and how much he delegated to his son, John Charles. Often when Olmsted was away for extended periods of time he would instruct his son on the care of the grounds, or changes to be made in the property:

> I don't object to the cutting away of certain bramble patches if brambles are to take their place—or anything that will appear spontaneous and not need watering or care. More moving or dug ground I object to. Less wildness and disorder I object to.(22)



1887 Plan

1904 Plan


PLAN OF
F. L. OLMSTED ESTATE
Brookline, Mass.
April 9, 1904.
Whits & Wetherbee – Civil Engineers,
Boston & Braintree.
FAIRMOUNT
ST.
DUDLEY
ST.
WARREN
ST.
STORE HOUSE
STABLE
STORE ROOM
SHOP
PLANTING DEPARTMENT
DRAUGHTING ROOMS
PLAN VAULT
RESIDENCE
RESIDENCE
Clothes Yard
Hemlock
Elm
Apple

By the late 1890's, much of the plant material had taken hold. Vines covered the house and a large expanse of lawn stretched to thick shrub borders to the south and the west, with the exception of an expanse of hill left open to the Clark sisters' cottage. The hollow and rock garden matured and the office wings of 1889 and 1891 replaced most of the service drive off Dudley Street. The general appearance of the property was one of natural encrouchment and illustrated many of Olmsted's picturesque ideals.

Waverly Keeling, a writer for the "Chicago Inter-Ocean" newspaper, wrote an article entitled "Home of Frederick Law Olmsted, Landscape Artist of the World's Fair" in the May 10, 1896 issue of the paper. The article describes the property:

> That home is as beautiful, as thoroughly in accord with all of nature's happiest little dreams - her grander ideals, her quaint, delightful notions - as the great park in the center of the Nation's metropolis, to which Mr. Olmsted gave the first great result of his keen susceptibility to the power of nature's best possibilities. Any one who rambles through the leaf-strewn walks and climbs along some rock, wooded path of Central Park today can safely imagine just such charming bits of scenery about the home of the man whose guiding genius made Central Park as it is, possible. . .
>
> The quaint, vine clad mansion itself faces Warren Street. In the summer it is almost hidden from either Warren or Dudley Streets, so dense is the vine foliage on the rocks that surround it, and the foliage that nearly covers the house itself, and so many are the trees that line the roadside or that stand upon the estate, and the estates adjoining. The Olmsted estate contains within a small fraction of 2 acres of land. All the fine shrubbery, the roses, and other flowers have been arranged about the grounds by Mr. Olmsted since 1883. Before that time the land was largely occupied by various kinds of apple trees.
>
> In no portion of the grounds is there any display of magnificence. Every shaded walk and every little rocky nook shows but a careful oversight of natures own simple ways. And none could wish it otherwise. It is a bit of nature's magnificence, and human hands, by seeking to embellish it with hothouse plants and marble figures and fountains of bronze cannot improve it.(23)

Seven years later, in 1903, Hazel G. Collins described the property again as part of an article entitled "Landscape Gardening in Brookline":

> The square, old house is almost entirely hidden from the street, yet far from discouraging intimacy, a sight of the place makes one long to explore its hidden beauties. The

> uneven pole fence is neither stiff nor painfully "rustic", and the bushes and vines hang over it as if longing to escape into the street. The beautiful archway, over the carriage entrance, covered with trailing euonymus is a picture in itself and frames another picture—the driveway and corner of the house, scarcely visible for the mass of shrubbery in the circle in the center of the carriage turn.
>
> Once inside the fence a perfect maze of wild beauty, from which there seems no escape, greets the eye. Following the little pathway, overhung by a huge lilac bush, from the driveway around the corner of the house, we suddenly come upon an unexpected breadth of view.
>
> A little lawn stretches before us. But even here the wild growth of bushes seems to grudge the house this little bit of cultivation, and intrenches upon its smooth green in irregular outline. Coming back to the carriage circle we discover a little path leading, apparently, into the fence, but making a turn brings us upon the street. So skillfully planned and planted is its opening that many people have never noticed its presence.
>
> A thing that impressed us particularly was the little dell. When the land was filled in to make the streets, most people would have filled in this little place on the corner, between the streets and the office buildings, bringing it up to the level of the rest of the site. But the genius of Mr. Olmsted saw its value, and made here a picturesque dell. A little flight of steps leads down into it to the tiny oval path. The plot in the center, as well as the banks, is planted with bushes, shrubs, wild flowers and ferns in picturesque confusion.(24)

In 1903 Frederick Law Olmsted died and Mary Olmsted, his wife, became the sole owner of the property. Mary remained in the house with her son Frederick Jr. and his wife, Sarah. The firm, run by Frederick Jr. and John Charles, changed its name to Olmsted Brothers and remained in the office portions of the building.

3. Olmsted Brothers 1904-1930's

In 1904 a complete survey of the property was undertaken. The resulting map and accompanying photographs give a good idea of the property's appearance at this time. Much of the plant material remained similar to that of the 1890's. The full design intent was realized as the plants matured.

In 1910 Hans Koehler, horticulturist for the Olmsted firm, was responsible for further plant additions and alterations made to all areas of the property. An annotated 1904 map and several planting lists indicate the work which he accomplished between 1910 and 1911. Many changes were

made, especially to areas in the south lawn along the laundry yard fence, to the hollow and to the rear courtyard.(25)

In 1911 a rough inventory of the grounds described the proportions as such:

1.8* Acres:

Buildings	.18A
Roads and stable backyard	.13A
Vegetable and flower gardens	.13A
Lawn	.39A
Balance	.97A

(laundry yard, rock, paths, herbaceous beds, etc.)(26)

In 1915 and 1925 the area of the estate decreased to its present size of 1.76 acres when the Clark sisters' cottage and the land surrounding it were sold.(27)

In 1917 Frederick Jr. went to Washington D.C. to assist with the war effort. While he was away, he made provisions that his mother, his wife, his brother and others were to receive vegetables from the garden outside the house. (Exact location of this garden is not known). He gave instructions that Kitt, the gardener, was to provide them with vegetables and "a careful account of amounts supplied to each party is to be kept, and at the end of the season, the expense of the garden be apportioned with due regard to the benefit received by each party."(28)

In 1921 Mary Olmsted died. At this time the house was turned over to the Trustees of the FLO estate. To simplify leasing arrangements, Olmsted Brothers purchased the house and in 1930 the entire property was turned over from the Olmsted Estate to Olmsted Brothers.(29) Frederick Jr., as a trustee of the Olmsted Estate, rented the house after his mother's death so that it would remain occupied. He later rented the house to short-term tenants during intervals when his work carried him away from the property for long periods of time. The upkeep of the grounds was the responsibility of the firm, with a certain percentage of the work paid for by FLO Jr. as a tenant of the house.

During the 1920's, much attention was focused on the design and upkeep of the property. In 1923 the hollow was replanted;(30) the steps were done in 1924;(31) the rock garden was redone in 1925;(32) the service courtyard and rear office courtyard were redone in 1926,(33) and in the same year plans for the annual test garden were set on paper.(34) This garden had been in existence for some time, but this 1926 plan is the only time that plans were drawn for it. Hans Koehler and three groundsmen are listed as being paid for all work done, with a few things contracted to outside companies.(35)

* This number is too small to agree with land records for the time; the actual property covered close to 2 acres in 1911.

Frederick Jr. and his wife continued to rent the house from the firm from 1930 to 1935/36. At this time, most of his work took him to the west and south. The house became inconvenient and had always been too large for his small family, so they decided to move.

4. Tenant Period 1936-1963

After Frederick Jr. left, the firm rented the house to various tenants over the next twenty seven years. During this period, the office was responsible for the upkeep of the grounds. At first this upkeep was paid for out of the office budget, later the grounds maintenance was added as an extra charge to the rental fee of the house.(36) There appears to have been an unconscious division of the property at this point. The front driveway, south lawn and west embankment were often considered 'house grounds', while the parking area, rear courtyard and hollow were considered 'office grounds'.

The firm continued testing some plants, especially bulbs, in the hollow and in areas behind the office parking lot. In 1938 beds of tulips were planted in a test garden above the storage shed.(37) The lower portion of this shed was presumably used as a root cellar and the upper portion as a garage by the house tenants. The garage was accessible by a gate off Fairmount Street.

Although very few new plantings were made during this period in any area of the property, requests by the tenants concerning the grounds were often honored. Such was the case for the Vanderbilt family (tenants from 1955-59) when a sycamore maple was planted at the southeast corner of the house to replace a tree which had died.(38) Another tenant requested that some pruning be done about the carriage turn, as some of the plantings had become overgrown and were hitting automobiles using the driveway.(39) Much of the plant material suffered from a lack of personal interest on behalf of the tenants and damage from a series of hurricanes during the 1950's. Mr. Cummings, a tenant from 1959-63, often complained about maintenance of the front driveway area.(40) The circle had become covered with weeds and the large American elm near the archway had died and had not been removed.

The archway at the front driveway had been rebuilt during the 1930's and the euonymus vigorously covered the top and sides. During the late 1950's, however, this archway collapsed, weakened by successive heavy snow loads. It was not replaced.(41)

5. Olmsted Associates 1963-1979

In 1961 the name of the firm was changed again: from Olmsted Brothers to Olmsted Associates. A year later, one of the principal members of the firm retired, and Joseph Hudak and Artemas Richardson remained as partners. When Mr. Cummings terminated his house lease on April 1, 1963, Joseph Hudak moved in and began to introduce new plant materials to the house portions of the property to replace those lost through disease and storms. Many of the rhododendrons, azaleas, yews and other shrubs in the

south lawn border were introduced by Hudak.(42) The small perennial garden at the west entrance of the rock garden was begun by Mr. Hudak and was later continued by the Richardson family, often with the advice of Mr. Hudak.

In 1964 Joseph Hudak gave up his financial interest in the firm and Mr. Richardson became the sole owner, although Mr. Hudak remained with the firm for another 15 years.(43) At this time the Richardsons moved into the house. They continued to introduce new plants onto the property and made their own personal statement in the design of the south lawn. In 1968 the Richardsons installed a swimming pool and terrace adjacent to the kitchen and conservatory. Large arrowwood, linden viburnum and mock-orange were removed to do this, as well as the laundry yard fence along which they had grown. Grapes and Japanese maples were planted along the brick wall surrounding the pool, and roses and peonies were planted at the edge of the brick terrace.(44)

The Richardsons constructed an herb and vegetable garden just east of the terrace along the house. The garden was designed as two squares, set side by side, with beds along the outside for roses and perennials. The brick paths and some of the plant material still remain. A brick edging was added to the perennial garden and more plant material was introduced. The Kousa dogwood at the end of this garden was also added.(45) Plants were added along the Warren Street fence to screen the house from the street, and a small two-car parking area was extended out from the carriage turn on the southeast side, replacing the southerly entrance to the carriage turn.(46)

The Richardsons extended a stone wall 5-6 feet from the rear of the barn. This wall maintained the grade of the rear slope and allowed power equipment access to the south lawn area via the path which was formed.(47) From 1963 to 1965 the rear (office entry) courtyard was replanted and a pitched roof was constructed at the rear office entrance to protect those coming into the office from the weather.(48)

In 1979, legislation was passed authorizing the National Park Service to purchase the site. The property was turned over to the Park Service in the spring of 1980. Since then, only routine maintenance has been performed (i.e. general clean-up, lawn care, leaf removal, etc.). Some rejuvenative pruning and experimental weed control was undertaken during the 1981 growing season under Park Service supervision. These efforts are described elsewhere in this report.

III. Analysis

For the purposes of this report, the property was divided into five areas (see Plan #4). This history, design changes and current plant materials of each area are discussed in detail in this section of the report, and an analysis is made of current conditions. Divisions were based on historical treatments as documented by maps, landscape plans, sketches, planting lists and photographs.

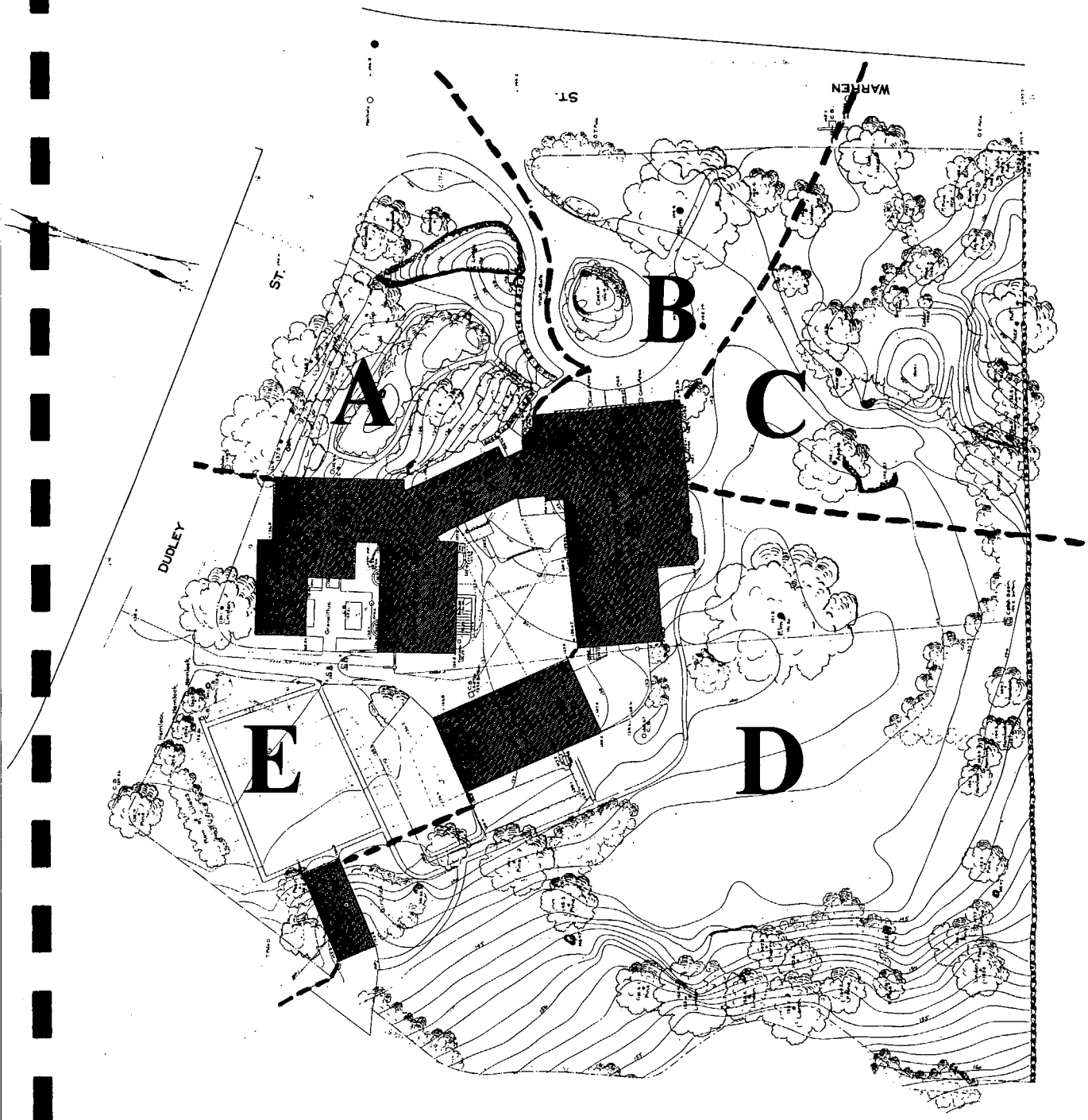
Maps illustrating current conditions accompany the description of each area. These are the result of an in-depth inventory of existing plant material. Each plant was identified, recorded on the map, and most were marked with temporary wooden labels. Identification became difficult when seedlings from established plant material were found which exhibited some characteristics which varied from the parent plant. In those areas where few records exist, it is difficult to determine if these variants are varieties which were introduced as experimental testing plants over the course of time or if these variants have become established on their own.

When a plant was used without a written record, as was often the case, the genus and often the species can be identified, but reference to a cultivar or particular strain of the species cannot be attached. Therefore notations such as Iris sp., Hemerocallis sp., etc. are as detailed as is possible. Should further research establish such plant species or cultivars, they may be added at a later date.

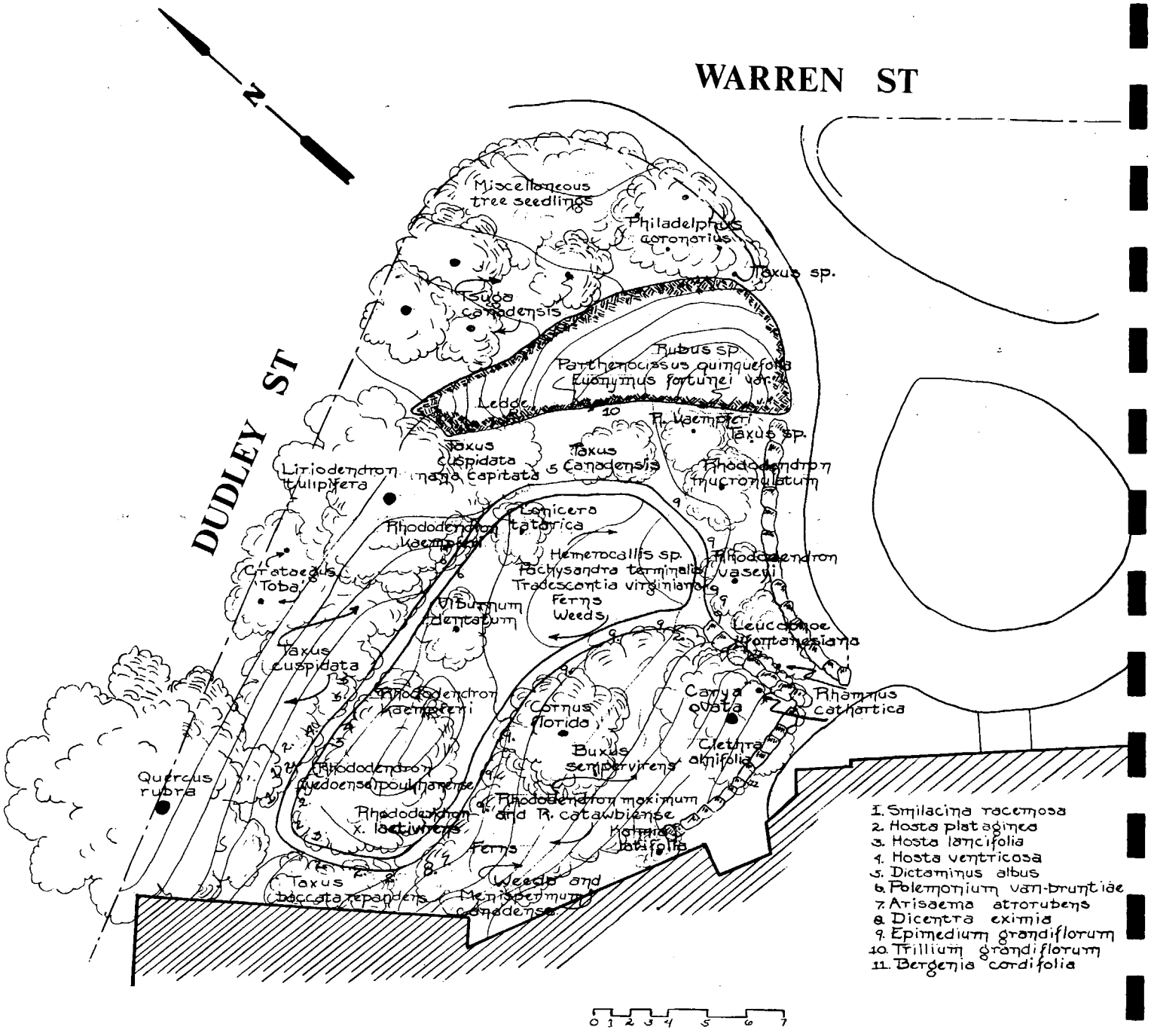
Olmsted often used introduced plant species to augment native plant material. Notations have been made on the plant list in the appendices concerning native, introduced or naturalized-introduced plant species. Overgrowth, pests and diseases have taken their toll on the current landscape. Specific problems and alternatives for their solution are discussed in detail in Section IV.

A. THE HOLLOW

When the Olmsted family came to the site in 1883 this area was simply a rocky dell planted with apple and pear trees. A large outcropping of Roxbury puddingstone lay at the eastern border. Below this, the ground fell away 8-10 feet then gradually sloped up to the west, leading to a flatter yard area directly north of the house. To the north an embankment sloped up to the level of Dudley Street. To the south another slope led across the front yard to a small apple and cherry orchard at the southeast corner of the property.(49) When the Olmsteds designed a new carriage turn at the front of the house it was necessary to do some filling and a long stone retaining wall was built to hold the grade. This wall defines the south border of the hollow and contains a small, picturesque grotto



Area Divisions



Area A ~ Hollow

that forms an effective backdrop for bed plantings on this side. Stone steps were constructed leading down into the hollow from just off the carriage turn. Set into the side of the embankment at the end of the retaining wall, these steps led to a path which circled below the puddingstone ledge, along the bottom of the north bank and up the west slope to the service driveway.(50) In 1889-91, when the office wing was added, the path was changed. It turned and followed the bottom of the southeast embankment to the steps again. This formed a low, irregular bed at the base of the hollow. Near the corner of the office wing a second exit led from the path to a door in the basement of the office. Eventually, a gate was installed in the fence and the path led out to Dudley Street.(51)

Gradually, the fruit trees in the hollow were replaced by trees and shrubs selected by Frederick Law Olmsted, Sr. There are no plans available for this first design; but photographs taken by John Charles Olmsted show parts of the hollow in its early stages.(52) There are no records or photographs indicating what plantings existed below the puddingstone ledge or the retaining wall at this time. One photograph shows the ledge covered with a deciduous vine, probably woodbine, an invasive species which adorns the stones even today.(53)

The pole fence installed in 1883-84 defined the boundaries of the hollow at the edge of the street. Vines (euonymus and possibly others) were planted along the outside of the fence. On the north bank, inside the fence, were set three trees: a red oak, a linden and a tulip tree. Deciduous shrubs (unknown species) were planted under the trees. A low stone wall, running from the north embankment to the puddingstone ledge, held the grade in this corner. There is no record of its origin, but it could have been installed at the same time the other improvements were made (circa 1884). Above the puddingstone ledge three Canadian hemlocks replaced three gnarled old apple trees.(54)

A shagbark hickory was planted during the 1890's at the top of the stone steps and a flowering dogwood was planted at the bottom of the southwest bank, close to the edge of the new path that circled the bottom of the hollow. A low, irregular bed lay in the center of this path.(55) There are no firm records as to the plant material used here or below the flowering dogwood.

A memo from Hans Koehler dated 4th January 1911, which discusses the earlier appearance of the hollow, indicates that the center bed had once contained rhododendrons and azaleas and the south bank has been planted with "coarse blackberry vines and some other coarse things on (south) slope to the west of the rhododendron group under the Cornus florida."(56) These plants had become unruly by 1911 and it was recommended they be replaced. Plans drawn in 1904 indicate masses of shrubbery in both areas. By the 1890's, many of the plants had become established in the hollow and the full effect of Olmsted's design could be appreciated.(57)

Apparently few changes were made to this area until 1904. At this time a complete map of the property was executed and improvements were made in all areas. A mountain laurel was planted by the office entrance, above the flowering dogwood.(58) This plant stands today, unusual in its growth pattern as a vine-like plant, clinging to the office wall. Rosebay rhododendrons were planted among the other shrubs along the Dudley Street (north) bank. Other plants may have been added as well, but the plant lists do not clearly indicate which plants were intended for the hollow.

By 1909 all the euonymus along the Dudley Street fence had been removed and a few deciduous shrubs took its place.(59) From 1910 to 1911, Hans Koehler noted improvements which needed to be made about the office grounds. His planting notes and a memo to the Olmsted Brothers show that the hollow had become extremely overgrown. Frederick Jr. wrote his brother about Koehler's plans:

> The planting has got into quite unsatisfactory shape as to details and is not very creditable to the office. It is entirely spearate from the rest of the place for improvements, in which Mr. Koehler has estimated nearly $1,500 more to be necessary. I have not decided how much I shall undertake this year, but I raised the question whether the firm might reasonably spend something in putting the hollow in order.(60)

Mr. Koehler attached a cost estimate for work to be done in the hollow, including manure, plants and labor, for $500.00.

The improvements Koehler suggested are outlined in plans found in the office files. Yews and mock-orange were to replace the rhododendrons planted in 1904 on the north bank, with euonymus and yellowroot as groundcover in between. Various perennials were to be established below the ledge and below the retaining wall. Trillium was to be planted at the base of the southwest slope, below the dogwood, running up into a mixture of ferns, Canada lily and snakeroot. It is impossible to say how much of this was accomplished. According to the planting lists, the perennials were added below the ledge and retaining wall, but the euonymus and yews to be planted on the north bank were held off for a later time.(61)

A plan for 1916, with gardeners notes added, shows some of the existing plantings and has notations for additional plant material. As there is no plant list to accompany this plan, there is no way of telling what the numerical notations refer to. A mock-orange existed near the end of the office wing in the northwest corner of the hollow. The hemlocks, tulip tree, linden and red oak still lined the north bank, and the hickory and dogwood stood on the southwest bank. A boxwood grew behind the dogwood and a Rhus aromatica (low-growing sumac) sat north of the dogwood at the base of the steps. Summersweet and ferns grew below the retaining wall near the grotto; rhododendrons and pyracantha filled most of the center bed.(62)

By 1923 the hollow had reached an impossible state and it became necessary to design a complete renovation plan. In a note to Frederick Jr., Hans Koehler described the necessity of this renovation:

> As regards the desirability of revising the hollow along the lines that my plan calls for, I think that there is no doubt. The hollow, of course, has some beauty, interest, and charm now, but perhaps you will pardon me if I say that it looks just a bit untidy and dilapidated, and that it could be made much more beautiful, interesting, and charming, a place that we should be proud to take clients into, (which surely is not the case now), a place of interest to and for

> study by the men in the office, especially the younger men (which, also, surely is not the case now).(63)
>
> Koehler's estimate of cost: $2,885.00
>
> Frederick Jr. replied:
>
> I have glanced at the plan for the hollow rather hastily and it seems to me good in principle though probably needing considerable refinement yet - in places it occurs to me that the planting might again become overcrowded if carried out literally as shown and I should think there were a few more things which would be worth using than your plan seems to indicate. The rhododendrons and deutzias doubtless should come out. How about the arch? How about cutting back and partly weeding out the overgrown euonymus on the parapet wall and restoring more of the sedum etc. that used to be there and on the big rock? Also how about maintenance costs? If the members of the firm in Brookline are willing to go into any such program I am leaving its details to be settled by you under P.G.'s supervision as to cost and design. The cost would come out of firm earnings over and above salaries so that I figure roughly that I should bear about 38% of it and the rest would be divided among the other firm members.(64)

At this time the north bank was redone as planned in 1910. The rhododendrons on the north bank were finally removed and yews and euonymus were planted in their place. The linden tree is not shown in this plan. It is unknown if the tree was lost to storm or to disease. Other plantings were added as indicated on the plan. A gate was built in the Dudley Street fence at the corner of the office wing and a small path led out from the circular bed.(65)

Hans Koehler pointed out in this plan that replacement of the stone steps should be considered. One year later, that suggestion was carried through. Low-growing groundcovers and perennials were used in between the steps and along both sides of the path. A pink shell azalea was planted along the path just east of the steps. This shrub is there today but few of the herbaceous plantings remain.(66) A photograph of a portion of the hollow with the new plantings shows the results of the 1923-24 work.(67)

During the years 1924-25 Hans Koehler and his men replaced some of the plants which didn't take and drew plans for additional plantings of iris and lilies for summer bloom.(68) Bulbs (narcissus, tulips and scilla) were added in 1927, 1934 and 1937. They were planted in the fall, then evaluated for color, size and performance the following spring.(69) In 1935 Euonymus vegetus carrieri was planted along the outside of the Dudley Street fence. These same vines cover the fence today.(70)

Notes pertaining to diseases, pests and fertilizing practices remain scarce. In 1934 the junipers in the center bed were infested with juniper web worms. Hans Koehler made the following notes regarding control methods:

> "Can be controlled by spraying with arsenate of lead, which would disfigure the plants, better spray with Wilson's O.H. diluted 1-15, or some other nicotine soap spray." Juniper scale was also present. "Spraying with a miscible oil, 1-20, in early spring is usually recommended, but a soap-nicotine spray early in June when the young leaves have appeared will probably help."(71)

Manure was used extensively as fertilizer throughout the grounds and allowances were made for the price of manure in each of the cost estimates for the hollow renovations. In 1940 the first note appears in the plant file regarding commercial inorganic fertilizer; an 8-8-4 fertilizer was applied as a test to certain perennials and shrubs along the north bank and some portions of the center bed. The areas where fertilizer was applied were indicated on a map and compared with control areas. This note mentions a bird bath on a rock in the center bed.(72)

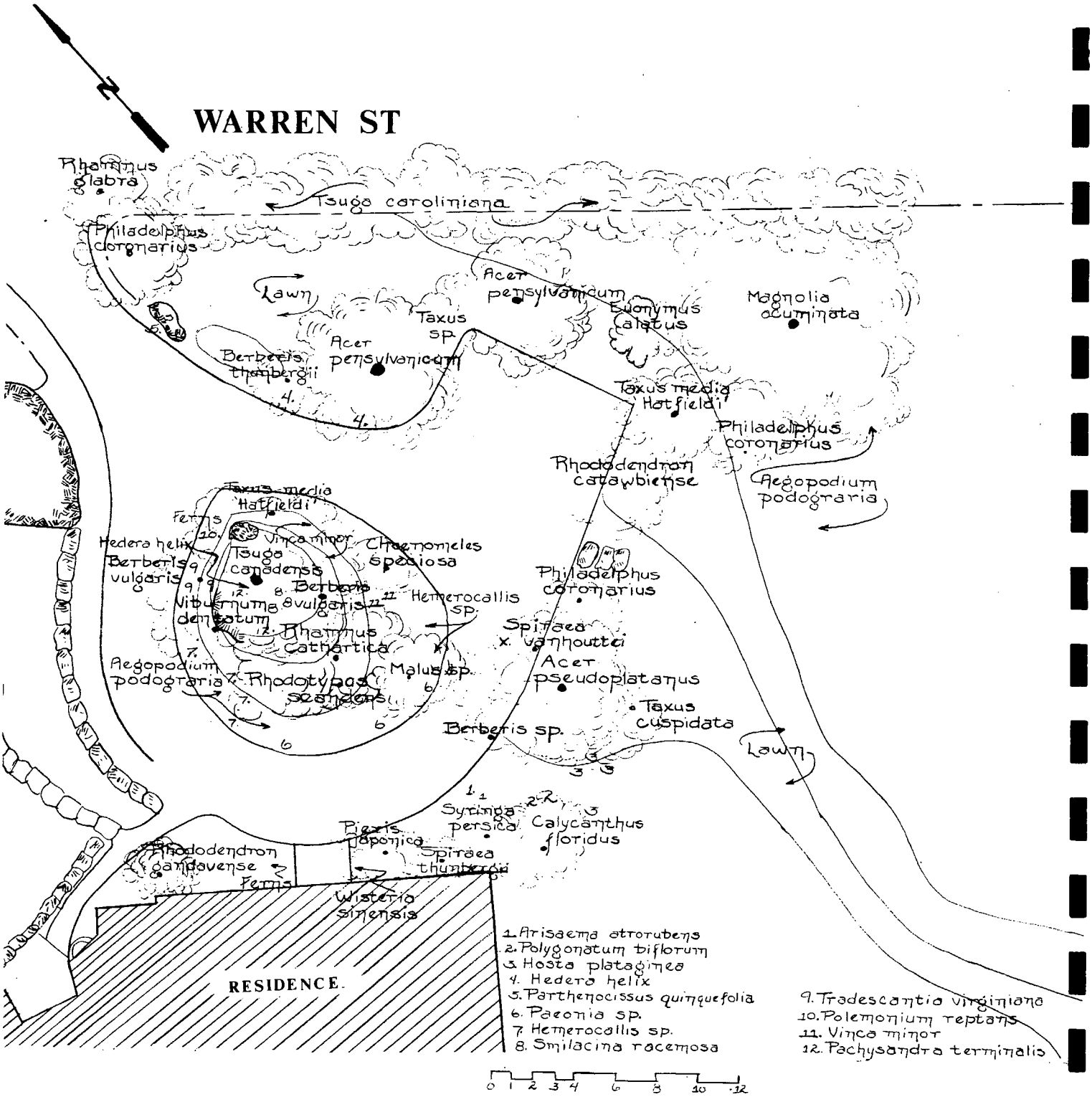
During the 1950's and 60's Joseph Hudak became the planting specialist for the firm. By this time the pyracantha at the northwest end of the center bed had so overgrown its bounds that passage had become difficult along the hollow path. Hudak pulled out many of the plants in this center bed and replaced them with azaleas, pachysandra and daylilies.(73) The daylilies were bought from the Merry family in Needham, local daylily breeders.(74) Rhododendrons and azaleas were planted under the dogwood and below the stone retaining wall for spring color. Herbaceous perennials were added throughout the hollow for spring and summer color. The desired effect was a seasonal garden with something in bloom throughout most of the growing season.(75)

Most of the plants in the hollow today reflect the combined efforts of Mr. Koehler and Mr. Hudak. Yews dominate the north embankment, azaleas and rhododendrons outline the south and southwest borders as they did in 1923. Daylilies still predominate in center bed. Of the original plantings done by F.L. Olmsted, Sr. only the red oak, tulip tree, Canadian hemlocks, shagbark hickory and flowering dogwood remain. Plan 5 shows the existing plant material. Many plants have introduced themselves into the area and, as weeds, should be removed as soon as possible before any harm is done to the intended plants.

The hollow has serious overgrowth problems. The yews on the north bank have become out of scale with their surroundings, as have the azaleas and rhododendrons. Serious efforts have been made during this study period to rejuvenate these species, but more work will be necessary over the next few years to bring them back to their proper size. The boxwood behind the flowering dogwood is severely overgrown. Rejuvenation efforts are questionable for this species, therefore cuttings of the plant should be taken before any pruning begins. Many seedlings have taken hold at the base of the Canadian hemlocks in the northeast corner. These should be removed as soon as possible. They have no historic value and are robbing the hemlocks of nutrients and water, both of which are scarce to begin with. Woodbine, blackberries, black raspberries and goutweed are other weedy species which must be dealt with. If let go, these weeds will smother the other plant material.

Spring 1926. The Hollow. Center Bed. View Northeast. Taken shortly after the new plantings were installed.

1981. The Hollow. Center Bed. View Northeast. Today much of the area is overrun with weeds. The plant materials have been changed over time. Little remains of the 1926 plan.



Area B ~ Front Driveway

Pest and disease problems this year include damage from gypsy moths, cottony aphid, scale, and blackfly or greenfly aphids. The hemlocks have a vascular disease which currently is in an arrested state. If the disease begins again and the needles start falling, a professional arborist should be consulted.

Most of the plants show signs of nutrient deficiency and drought. This is partially due to the increased number of weedy plants, but the major problem is that little or no fertilizer has been applied over the past few years. The shrubs already show signs of chlorosis (yellowing of the leaves caused by poor chlorophyll production, generally due to lack of essential nutrients). Given the age of the large trees and the rocky nature of the area, a concerted effort at regular fertilization and watering should be undertaken, including the addition of organic matter as a soil amendment.

Despite these setbacks, the hollow has many assets. Those trees planted during Olmsted Sr.'s tenure are significant for their size and age. The Kaempferi rohdodendrons have an unusual coral color when in bloom. The epimedium along the edges of the path should be encouraged and shown to the public as an effective but little-used groundcover. The hollow has traditionally been a testing garden and served as a major focus of the office grounds throughout the firm's history. The picturesque quality of the hollow should be emphasized and much can be done in the future to reestablish some of the plant material which grew here previously, especially varieties of iris, lilies and bulbs for seasonal accents.

B. FRONT DRIVEWAY

In 1883 a few fruit trees and a small elm were the only trees growing in this area. A driveway led from Warren Street along the south side of the house directly to the barn.(76) In 1884 John Charles Olmsted and Charles Eliot redesigned the area to include a carriage turn and a new entrance accented with a wooden archway.(77) A second entrance led to the circle from a gate in the fence south of the turn. Euonymus was planted on both sides of the arch and trained to cover the archway and the fence along Warren Street. The fruit trees were removed but one elm remained.(78) In later years this elm became hollow inside, so that one could stand inside and look out the top to the sky. This tree came down in a hurricane in the late 1950's.(79)

To the north, at the edge of the driveway, a flagstone sidewalk was built. Later pictures show a wooden boardwalk set on these stones leading from Warren Street along the edge of the driveway to the front door and then to the office door. The top of the retaining wall rose 2-3 feet above this sidewalk, forming a low stone wall.(80)

In the center of the carriage turn a low mound or hillock was planted with deciduous shrubs surrounding a Canadian hemlock. When mature, these plantings prohibited a view of the front door from the street.(81) The visitor's curiosity was aroused when he entered the drive, as he had to wind his way around the circle to see what lay on the other side. This technique is still used by landscape architects for modern driveway design.

Vines grew on trellises on both sides of the front door shading the stoop throughout the summer months.(82) At the southeast corner of the house another elm was planted, with masses of shrubbery beneath.(83) Wisteria was planted along the house and encouraged to climb up the sides.(84) South of the circle various shrubs, deciduous and evergreen, softened the lines of the driveway. Shrubs were also planted along the pole fence at Warren Street.(85)

By 1890 euonymus covered the archway and front fence. The hemlock masked the house from the street and the wealth of plant material about the driveway presented a lushness of different shades of green.(86)

In 1904 a white Chinese lilac, St. Johnswort and rose were ordered for the southeast corner of the house.(87) Perhaps other plantings were made along the driveway at this time but the plant lists do not indicate their location.

1908 the euonymus on the front fence was growing so profusely it was creeping through the poles to the inside of the fence.(88) This euonymus was cut back severely, or removed (the records are not clear) and replanted in 1935.(89) No further records exist for the area until 1936, when varieties of epimedium donated by W.N. Craig were planted south of the vehicle turn under a bridle wreath.(90)

There is no record of when the second entrance gate and path were eliminated. The Richardsons built a two car parking spot in this area when they moved in.(91) The entrance arch was lost in 1958-59.(92) The drawings for the original design are still in the Olmsted archives, therefore an exact replica would be possible should the archway be replaced.(93)

A row of Carolina hemlocks was planted along the front fence in 1967. Many of the previous shrubs along the fence had been lost to disease and storms and the hemlocks provided a screen from the street.(94)

A sycamore maple at the southeast corner of the house was planted by Mr. Riley during the 1950's. It was a seedling taken from the west bank and members of the firm were impressed with how quickly it grew here.(95) A Ghent azalea was added to the northeast corner of the house and many Hatfield yews were planted about the driveway during the 1960's.(96)

Today the layout of the driveway is the same as when it was built in 1884, except that the pedestrian path to the south has been replaced by a two-car parking area. Problems with overgrowth, weeds and disease are apparent. The hemlock planted by Olmsted Sr. has reached enormous proportions and should be carefully preserved. A few of its lower branches may have to be pruned, to permit light to reach the shrubs and groundcover below. The seedling buckthorn should be removed as it is shading the crab apple and jetbead below. Two seedling native barberries are unusual as this species has been outlawed in most states where wheat is grown. This barberry is an alternate host to the damaging wheat rust (Puccinia graminis tritici). It cannot be purchased commercially and therefore is generally not seen in cultivation.

February 1885. The Front Arch. View Southwest.
Photo courtesy Frances Loeb Library, Harvard University.

c. 1935. The Front Arch. View Southwest. The Euonymus just beginning in this photo eventually covered the arch.

May 1935. The Hollow. View Southeast to Grotto.
Note sitting area under dogwood.

c. 1885. The Rock Garden. View South. This early design included little shrubbery. It was replaced by the present design in 1926. Photo courtesy Frances Loeb Library, Harvard University.

Goutweed has almost completely shaded out the pachysandra, vinca and ivy which grew in the circle and in front of the house. Strong efforts at goutweed control and the reestablishment of previous groundcovers would increase the attractiveness of the area. The Ghent hybrid azalea at the northeast corner of the house has been sickly and will require special attention. Powdery mildew is a problem with this plant during July and August. The foundation plantings at the southeast corner of the house are suffering from nutrient deficiency and too much shade from the sycamore maple. Pruning for more light or replacement of the shrubs may become necessary. Likewise, weeds and unwanted seedlings are a problem in the bed beneath the sycamore maple and along the edge of the parking area.

The striped maple is noteworthy for its size and healthiness. In this area these trees suffer from trunk decay and usually die before getting too large. This specimen shows signs of the disease, but so far has not suffered severely. Plans for replacement with a different species may be necessary should the tree eventually succumb. The mock orange at the drive entrance is one of the older species on the property. No record was made of when this was planted, but many of these were ordered in 1904 and 1910.(97) This plant is very overgrown and should be radically pruned for control.

There is no planting record for the smooth buckthorn on the Warren Street side of the entrance fence. This is a nice specimen but it should be watched for size control, (it should not obscure the view of traffic leaving the driveway). Woodbine, weeds and bits of overgrown euonymus obscure much of the entrance fence. When this area is carefully cleaned out, the effect will be more in keeping with the Olmsted design intent.

C. ROCK GARDEN AND SOUTHEAST CORNER

Early maps of the Clark farm show apple trees, an ash and a hickory covering this portion of the property.(98) A map circa 1887 indicates the same trees and a gravel quarry where the rock garden is today.(99) John Charles Olmsted's early photographs (1885-87) show the field-like qualities of this area with a clear view of the fence along Warren Street and the stone wall marking the boundary along the south lawn.(100) As the Olmsteds settled on the property, one can see a gradual progression in the amount of plant material placed in this area. Unfortunately, photographs illustrate the early stages (1883-87), and the property in 1904, but there are no photographs of this area taken during its maturing process. One photograph taken in July 1885 shows a woman working in a low garden planted with yuccas, small shrubs and perhaps a Devil's Walking Stick and a euonymus. The general shape of the path and the topography of the area indicate that this is an early version of the rock garden.(101)

Some years before 1904 the area was planted and the rock garden was established. The estate plan for 1904 indicates pines, birch, ash, cherry and apple trees and others scattered about the area.(102) The rock garden path is present and planted with birch, cedar and various shrubs not shown on the map.(103) Photographs taken at this time indicate the vast amount of plant material which had filled in the area, effectively screening the house from the street and creating an interesting terminus to the view from the west bank. Here 'nature's bounty' was eloquently displayed.(104)

Hans Koehler's 1910 planting notes show plans for the addition of rhododendrons, pieris and yews; groundcovers such as pachysandra and epimedium; and perennials and bulbs of all kinds: scilla, phlox, bellflowers, soapwort, lungwort, sempervivums and many others. Order sheets for 1911 show that many of these plants were purchased and no doubt were planted as shown.(105) We have few photographs showing the appearance of the area at this time. 1910 is the first time a cucumber magnolia appears on the plans near the Warren Street driveway.(106) Whether this is an early planting and was not shown on the 1904 plan or recently planted for 1910, it is impossible to say.

Detailed plans for this area do not appear again until 1924-26.(107) Order sheets indicate most of the material was purchased as planned.(108) Much of the shrubbery shown on this plan still grows in the area today. Two buckthorns marked the entrance to the path from the west; mountain laurel grew along both sides of the path; and the east end was dotted with mock orange, jetbead and dogwood. Many of the trees remained as they were in 1904, with the addition of a horsechestnut and a barberry (shrub) atop the hillock north of the path. Rhododendrons, yews, epimedium, pachysandra, ferns and various perennials were added to the area as undergrowth and for seasonal color.

A perennial garden at the west entrance of the path was introduced by Joe Hudak and continued by the Richardsons. Many of the yews and rhododendrons bordering the lawn north of the rock garden were also planted by Joe Hudak.

Today, many of the trees here remain from early plantings. Two very large pines remain of the three seen in an 1885 photograph.(109) The cucumber magnolia is grand and dominates the eastern edge of the rock garden. A large ash and cork tree stand along the fence and stone wall junction on Warren Street. Another ash and a large white birch stand along the stone wall a little further to the west. A group of sweet birch stand near the stone wall at the west entrance to the rock garden. A sweet birch and white birch grow side by side from the summit of the rock garden hillock and a stand of Devil's Walking Stick, left from Olmsted Sr.'s time, decorates the northern edge of the rock garden. Viburnums, yews and azaleas border the lawn to the north, screening the rock garden path from the house. Gnarled old mountain laurel reach for light along the path, competing with seedling ash and maples which have taken root and tower above them. The perennial garden remains much as it was in the 1960's, with only a few changes in plant material.

Goutweed forms an effective groundcover beneath the magnolia and those trees east of the rock garden. It does not appear to be choking out other groundcovers in this area. In the spring, scilla covers the area with a purplish-blue carpet. The path of the rock garden itself is so shady that few weeds have been established, goutweed is not a problem and a few bits of vinca struggle to survive.

The 'weeds' in this area are trees. Maples, ash and buckthorn have taken hold and threaten the intended plantings. The mountain laurel did not flower in 1981 due to drought, lack of nutrients and shade.

Overgrowth is a problem here as well. Many of the yews and azaleas have grown out of scale with their surroundings. An arrowwood and jetbead have become so

F L. OLMSTED ESTATE
BROOKLINE MASS

ROCK GARDEN

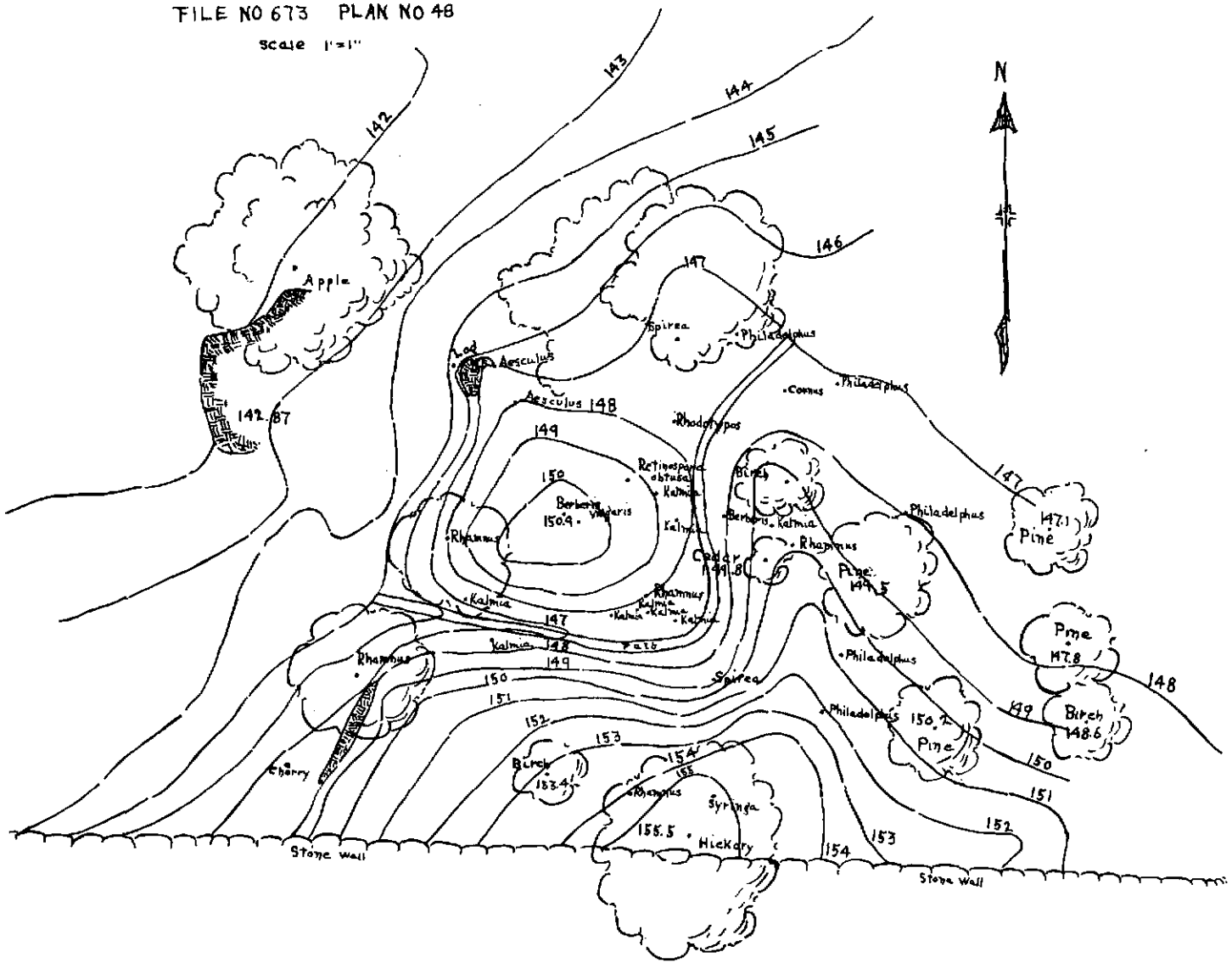
Additional Plants Not Shown On Original Survey

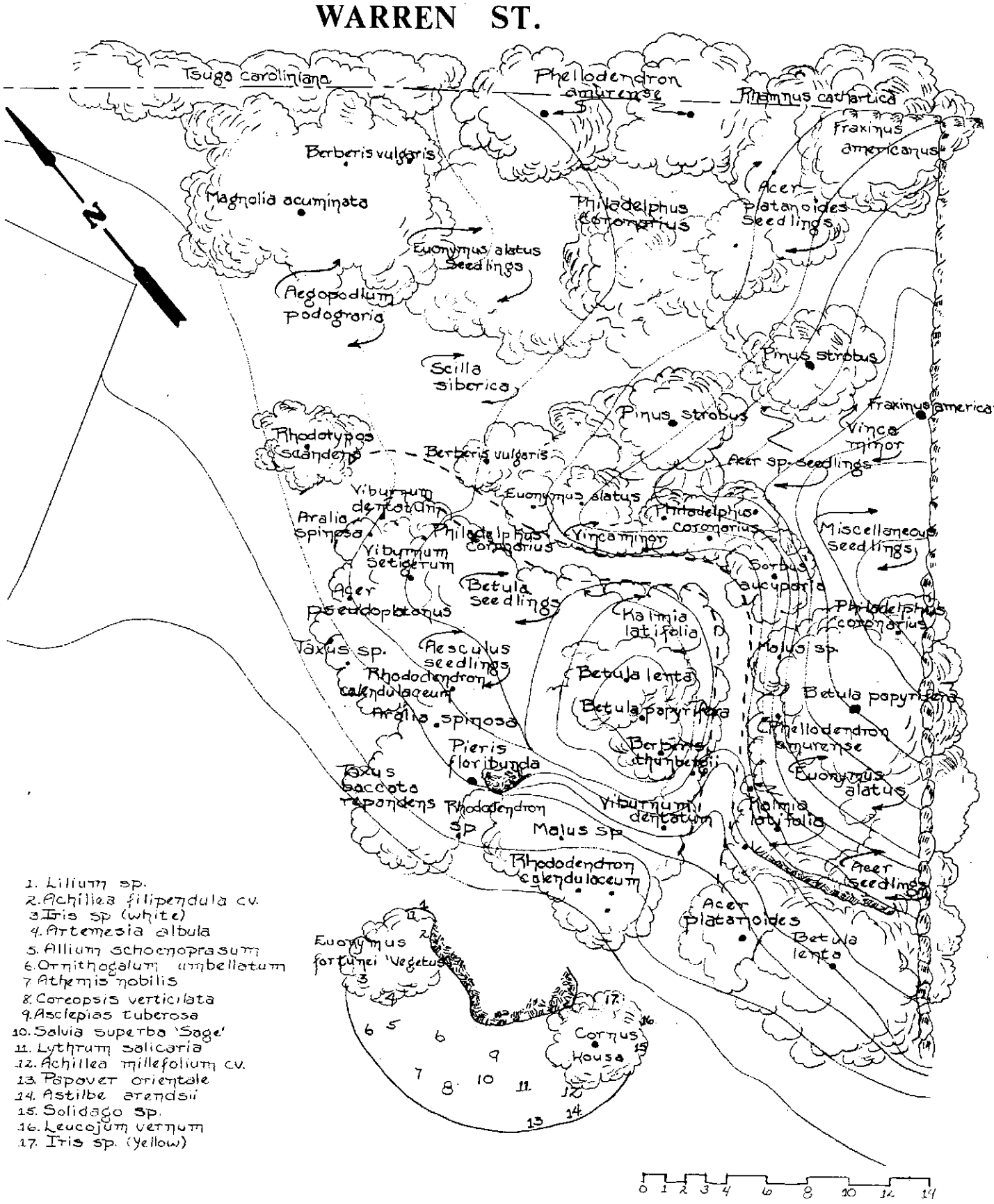
Olmsted Brothers Landscape Architects

Brookline Mass November 22, 1926

FILE NO 673 PLAN NO 48

scale 1"=1'





1. Lilium sp.
2. Achillea filipendula cv.
3. Iris sp (white)
4. Artemesia albula
5. Allium schoenoprasum
6. Ornithogalum umbellatum
7. Athemis nobilis
8. Coreopsis verticilata
9. Asclepias tuberosa
10. Salvia superba 'Sage'
11. Lythrum salicaria
12. Achillea millefolium cv.
13. Papover orientale
14. Astilbe arendsii
15. Solidago sp.
16. Leucojum vernum
17. Iris sp. (Yellow)

Area C ~ Rock Garden

large that they block the east end of the pathway. Selective pruning and elimination of weedy trees will do a lot toward rejuvenation of this area. Cottony aphid and nutrient deficiency will need attention as well. Some powdery mildew has been evident during the hotter months, but this may be controlled with increased air circulation, (achieved through pruning and weeding).

All efforts should be made to preserve the older species of trees and shrubs. The introduction of historic bulbs and groundcovers, would aid in water retention and increase the beauty of the area. The goutweed under the magnolia could remain, but flower heads should be clipped and the border areas should be watched to keep the species within bounds.

D. SOUTH LAWN/REAR EMBANKMENT

Historically this area, like the others, began with elm, apple, pear and cherry trees.(10) The stone wall at the Gardner property line was always visible from the house, as was the view to Warren Street.(111) In 1883 the barn was located in the middle of the west embankment. The Olmsteds had the barn moved closer to the house and enclosed the service yards and new driveway to the north and west with lattice fencing.(112) The driveway was removed from the south side of the house and a footpath was designed which ran from the front circle around to the south side door into the plant room.(113) None of the fruit or elm trees was removed immediately according to early plans, but masses of shrubbery were added along the footpath and close to the stone wall.

The plant room at the southwest corner of the house provided an excellent view of the south lawn.(114) When first built this room had a glassed in bay window with brick foundation and glass roof. In the summer the glass panels in the roof and on the sides were removed and plants were allowed to spill over the low brick foundation. On hot days a striped awning was pulled out above the opening for shade.(115) Some time later (circa 1910) the glass roof was replaced by a permanent shingle roof.

From this room the lawn sloped away from the house to the west and to the south, then leveled off to stretch as far south as the property line (stone wall) and as far west as the base of the rear embankment. A high lattice laundry yard fence ran from just outside the laundry room ell to the end of the relocated barn.(116) A small access path ran between the house and the fence; in general this path was well hidden by shrubbery.(117)

As the fruit trees gradually disappeared and other shrubs took their place, one large elm in the center of the lawn outside the plant room, was allowed to remain. It stands today and is often referred to as the 'Olmsted elm'. Photographs (c. 1885) show the tree covered with vines, a favorite trick of Olmsted Sr. to give increased winter interest to a deciduous tree.(118) Later photographs (1904-08) show no vines on the tree. They were no doubt removed during the 1904 renovations.(119)

During the 1880's and early 90's plants were added along the stone wall. A stand of Canadian hemlocks was planted southwest of the Olmsted elm.(120) These evergreens, when mature, effectively screened the Gardner house from view. Other shrubs, deciduous and evergreen, lined the border in an irregular pattern.

There is no record as to what plant species Olmsted used here. Photographs taken during the 1880's show these shrubs in winter, or in their early stages, making identification difficult.(121) By 1900 most of the shrubs had matured and the stone wall was no longer visible.(122)

Of all areas to be replanted, the rear embankment was one of the last. The fruit trees remained well into the 1890's gradually replaced by maples, birch and evergreens.(123) Few photographs exist of this area. References have been made to a rose and vegetable or flower garden behind the barn fences, but no photographs remain which might tell the size, shape or plant material used in this garden.(124) Photographs taken by John Charles often show a cleared grassy opening extending up the embankment to the Clark sisters cottage.(125) The hill was used for tobogganing in the winter, for dancing and similar outdoor activities in the summer.(126)

By 1904 only one apple tree and three cherries remained.(127) Flowering perennials, groundcovers and various shrubs lined the pathway to the plantroom door; wisteria and actonidia covered the house walls.(128) A few perennials grew amongst the shrub border, which changed its character as different species of flowers and shrubs came into bloom. One photograph, taken between 1904 and 1910, shows two magnificent bridal wreaths in bloom at the east end of the border near the rock garden.(129) Pines, lindens and sweet birch had grown up along the hill. One cherry tree remained and various shrubs formed an interesting undergrowth beneath the larger trees.(130)

A kitchen and pantry addition was added to the south wall of the original laundry wing (circa 1904-1910). The laundry yard fence butted the end of this new addition and continued around to the barn as before.(131) A path was built from the plant room in front of the fence and continued behind the barn where it split and led up to the storage shed or down to the experimental annual garden. This pathway is well illustrated on the 1904 plan.(132) The laundry yard fence was decorated with hollyhocks, woodbine and other herbaceous perennials. A few shrubs (arrowwood, linden viburnum, and mock orange) anchored the fence near the house wing.(133)

Little is known about the construction of the lawn or its care until 1903. A note in the planting files describes making over the office lawn. Mr. Parker's note describes three ways to deal with the sod: 1) truck it away 2) plow sod under and 3) strip sod and a) burn it on premises, b) cast it away, c) bury it. Apparently he tried burning the sod (3a) but the sod was soaked with rain at various times and did not dry out properly. When they tried burning it the sod smelled horrible so they buried it instead. He recommended carting the sod away the next time. The lawn was harrowed three times, then planted with crimson clover through the fall. Mr. Parker does not discuss the reasons for remaking the lawn or the grass seed mixture planted in the new lawn.(134)

Hans Koehler's planting notes for 1910 recommend the addition of weeping yews, pieris, Japanese holly and others in the shrub border but these plants were tagged for planting at some later time. It is doubtful these were ever installed. Little more was planned until 1938 when a tulip testing garden was installed along Fairmount Street above the storage shed.(135) These bulbs were evaluated for size, color and performance.(136) In 1940 a fertilizer test was run with two thirds of the bed fertilized with 8-8-4 and the remaining portion given no fertilizer as a check.(137)

No further records exist for changes until the 1960's. According to Joseph Hudak, many of the plants suffered severe damage from hurricanes in 1938, 1958 and 1963.(138) Mr. Hudak and the Richardsons added many of the yews, azaleas and rhododendrons along the borders in the 1960's.(139) In 1968 the Richardsons drastically changed the character of the south and rear lawn by installing a large bricked-in swimming pool between the barn and the house where the laundry yard fence was formerly located. A raised brick terrace was built at the same time adjacent to the kitchen and plant room.(140) An herb and vegetable garden extended from the end of the terrace along the house to the southeast corner.(141) Six grape vines were planted along the south wall of the pool and roses and peonies were planted at the terrace wall. Three Japanese maples were planted at the west end of the pool facing the rear lawn.(142)

Today much of the south lawn remains as the Richardsons left it. The pool is maintained as is the herb and vegetable garden. The Olmsted elm stands majestically in the center of the lawn and its care is carefully monitored to protect the tree from the fatal Dutch elm disease. The hemlocks planted by Olmsted Sr. remain, as do many of the shrubs along the border to which few dates can be attached. A large stand of ostrich ferns sit below the shrubbery directly south of the terrace. Their foliage contrasts in color and texture with the foliage in the shrubs forming a lush border which changes with the time of day and with the season. Some thinning has been done recently to eliminate some of the maple seedlings along the west embankment. These were beginning to choke out other tree species. The pathway up the hill to the Clark cottage no longer exists. A large stand of sweet birch has taken its place. Two large Norway maples mark the corner boundaries of the Clark property. The red form, Acer platanoides 'Schwedleri', is similar in age, color and form to one planted a the Arnold Arboretum in 1896. Perhaps this is another gift from Professor Sargent.

There are many variants of Japanese maple along the border of the embankment and behind the shed at Fairmount Street. Two very large specimens of this species are no doubt the parents of the smaller offspring. One 'parent' stands at the middle edge of the embankment not far from the pool. The other stands below a large Norway maple along Fairmount Street. Both of these specimens are valuable for their size and growth habit.

A large specimen of Pyracantha coccinea grows at the west end of the shrub border. This plant is an older species, replaced in the nursery trade today by the cultivar 'Lalandei', a free fruiting form. The true species is seldom grown and therefore presents an interesting plant for horticultural visitors to see.

Drought and poor soil conditioning cause the lawn to burn in more open areas during the hot summer months. This condition may be controlled with additional watering. Lime and fertilizer should be applied each spring.

Along the south side of the lawn, goutweed grows beneath the shrubs and the ferns. It does not appear as weedy here as it does in the hollow or beside the front driveway. Blackberry and raspberry vines as well as escaped Devil's walking stick and maple seedlings are weed problems here. Overgrowth of the yews and azaleas may become a problem. This is not as apparent as in other areas because of the enormity of the Canadian hemlocks which form the backdrop for the area.

Along the west embankment many of the shrubs are suffering from lack of nutrients, too much shade and overgrowth. Immediate rejuvenation of these plants will be necessary if they are to survive. It is probable that plants were set out in this area for experimental purposes and were grown for use later in other parts of the property. Notes by Hans Koehler on some of the planting lists indicate extra plants were "heeled in" for replacement purposes. Some of the shrubs (deutzia, spirea and others) and two katsuratrees were no doubt extra or experimental plants of this type.

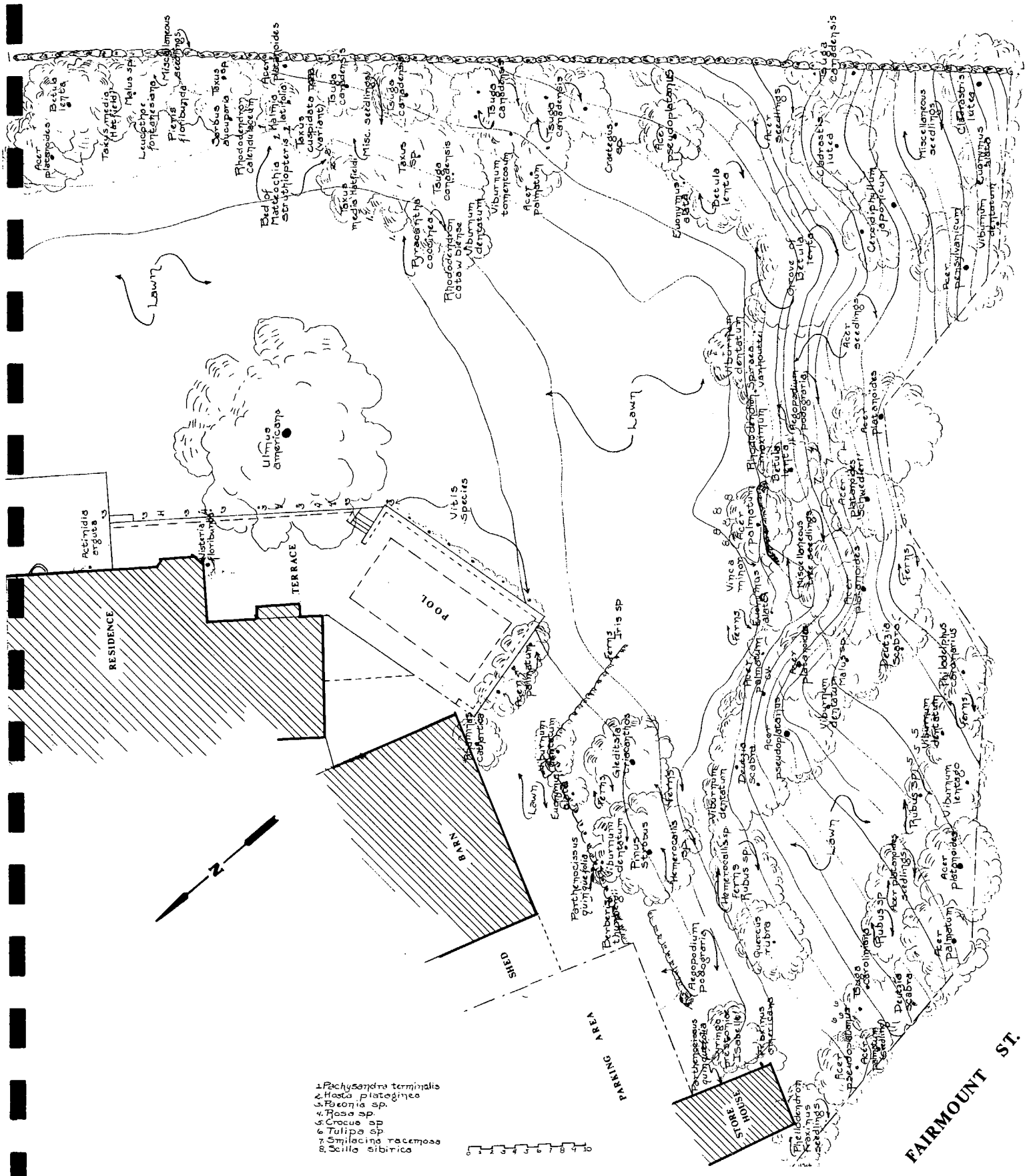
A large yellowwood near the southwest corner of the property was removed during the study period. The tree was struggling to survive and leaning at a precarious angle to other trees in the area. The inner core was discovered to be completely decayed. Seedlings of this tree remain in the vicinity.

Ferns, false Soloman's Seal, daylilies, scilla, a little struggling vinca and pachysandra are the only herbaceous materials left on the hillside. Because the shade is so dense, little herbaceous material survives under the trees.

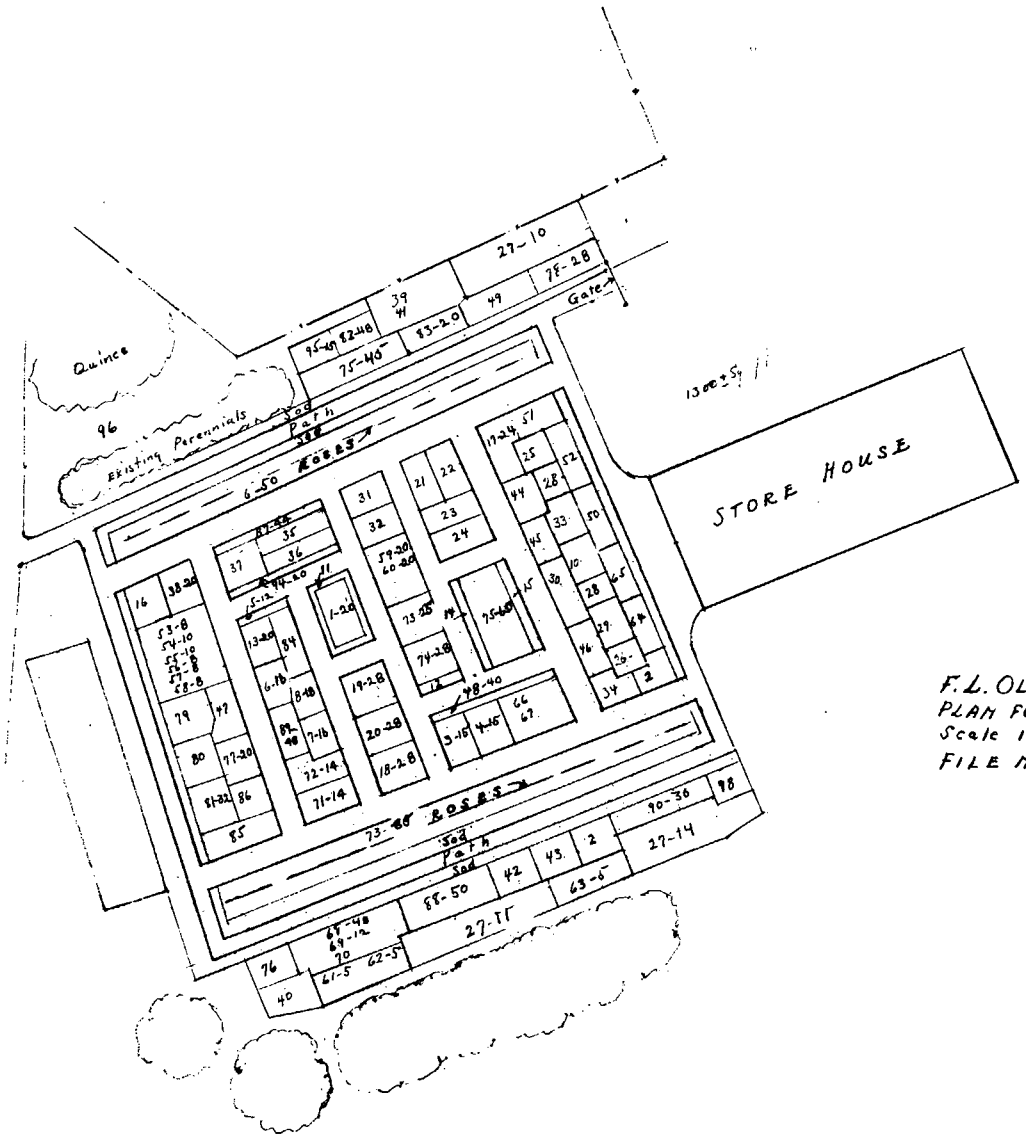
Seedling Norway maples, Sycamore maples and blackberry vines form the majority of tree weed problems. The maple seedlings are becoming the most damaging as they shade other trees and compete effectively for what nutrients remain in the soil. This problem will need serious attention the first year, as many seedlings have reached a considerable height. Yearly summer or fall thinning will be necessary to keep seedling density under control.

Pest and disease problems are similar to those in other areas. Gypsy moths, cottony aphids, scale and blackfly or greenfly aphids are present, but have not caused as much damage as elsewhere. Use of the west embankment as a heel-in area or short term nursery should be considered. Plants grown here can be transferred to other areas on the property as they are needed. Careful management will be required to encourage good plant growth and maintain the naturalistic effect. Serious consideration should be given to removal of the pool, terrace, herb and vegetable garden. These additions have drastically altered the character of the area along the house and do not respect the Olmstedian principles of design which have shaped this landscape. Instead, they appear as an intrusion upon the peaceful naturalistic setting that used to be here.

The pastoral beauty of the south lawn has been enjoyed as part of the house since the Olmsteds arrived in 1883. The 'borrowed' view of the Gardner estate grounds and the effective screening of Fairmount Street and the buildings on the Clark and Gardner properties give the feeling of a much larger area than actually exists. The dark green plant material bordering the lawn, contrasted with the lighter background material on the other estate, heightens this sense of spaciousness. Protection of this atmosphere will preserve this illustration of Olmstedian principles for the visitor to observe and appreciate.



Area D ~ South Lawn



F. L. OLMSTED ESTATE
PLAN FOR GARDEN of ANNUALS
Scale 10'=1" 1926
FILE No 673 PLAN No 45

E. SERVICE AREAS

When the Olmsteds redesigned the path system for the grounds in 1884, the northwest corner of the estate was heavily altered. A service entrance was built coming in from Dudley Street which led to an open circle in front of the relocated barn.(143) The pole fencing which lined the perimeter of the property turned in and followed both sides of the driveway, terminating at a gate in the lattice and board fence which surrounded the barn yards.(144) Two apple trees, a stand of pear trees, and a mass of quince bushes dotted the grounds to the west; the grounds to the east sloped down to the hollow.(145)

After the new office wings and plan vault were added in the early 1890's, the driveway from Dudley Street was straightened but still led to the service courtyard between the barn and the house. This area was further defined by the office addition of 1901 which resulted in the formation of a large rectangular courtyard between the buildings and a smaller office entry courtyard closer to Dudley Street. The pole fence continued to line the driveway, but gates were added on both sides almost directly across from each other for easy access to the office entry courtyard and a large experimental garden on the opposite side (where the parking lot now stands).(146) Easy interpretation necessitates dividing this area into three parts: the parking area, service courtyard and the office entry courtyard.

1. Parking Lot/Annual Garden

Little is known about the early use of this area. A garden was present when the survey was done in 1904; a large rectangular area with a walkway around the perimeter which led to the rear of the barn at the southwest corner. The garden was bordered to the west by the storage shed, to the south by a board fence which screened it from the barn, to the east by the pole fence and to the north by a bank of lilacs, a large pine and three hemlocks along Dudley Street.(147) The contents of this garden are unknown, except for one 1926 plan for an annuals test garden.(148) Before 1926 the garden probably had similar uses. It may have also served as a heel-in area for nursery plants purchased for the grounds. The 1926 plan and accompanying planting list indicate many flower varieties we hear little of today. Polianthus, Didiscus, Nigella, Reseda and Arctotes are not popular in today's flower gardens.(149) This entire area must have been beautiful each summer when all was in full bloom.

Shortly after 1926 the entire area was turned into a gravel parking lot.(150) The increasing number of employees who drove to work necessitated an area for parking. Since the front driveway was for the use of the house tenants; this area was the largest and most convenient. The pole fencing along the driveway was removed and the area was laid with gravel. The lilacs, hemlocks and quince shrubs remained; Vinca minor and Euonymus radicans carrieri were ordered for ground cover along the perimeter.(151)

The area remains today as a parking lot for employees and visitors. One hemlock and a portion of the lilac hedge remain on Dudley Street. The pole fence at Dudley Street is covered with wild fox grapes. Weedy trees (i.e. buckthorn, wild cherries and horsechestnut), have introduced themselves

along the borders. Bits and pieces of shrubbery such as honeysuckle, rose and snowberry remain west of the parking lot beside the storage shed. It is difficult to determine whether these plants are remnants of introductions originally grown in the garden or were added later. A large cucumber magnolia dominates the fence area north of the storage shed. By its size, it was probably planted here by Olmsted Sr. It is not labelled on the 1904 drawing, but a tree is indicated in its location. Four labels were placed in this tree trunk in 1939. Notes were made indicating where the labels were made, the method and any treatments (such as varnish) they were given. Label endurance was tested and the results were used when the firm made recommendations for the type of tree labels to be used in park or arboretum plantings.(152) These labels are on the tree today. The fact that they all say Norway maple and are nailed to a cucumber magnolia is somewhat confusing.

The area south of the storage shed has been changed drastically over time. The 1904 plan indicates that birches grew here.(153) An undated photograph illustrates beautiful plantings of daylily, bridal wreath and ferns along a stone path beneath these birches.(154) Some time later a board fence was added from the existing fence corner to the shed and these birches were replaced with groundcover.(155) Joe Hudak planted a Preston hybrid lilac here in the 1950's(156) and Charles Riley planted an apple tree at the southeast corner of the shed near the parking lot at about the same time.(157) Both of these trees are still present. The large clump of flowering quince at the northeast corner of the barn shed remain from the Clark farm.(158) This is the only plant remaining from the original orchards. The fruit from this shrub was a favorite for making jams and jellies in the late 19th century. This plant is now extremely overgrown and did not blossom in 1981. It must be tended properly and encouraged to flower if visitors are to enjoy the species.

Along the vault wall bordering the parking lot entrance are daylilies, snowberries and one enkianthus. The history of these plants is not known. Daylilies grew at the corner of the vault when it was first built in 1901.(159) A large clump of daylilies currently surround a barberry at the entrance from Dudley Street. These daylilies are similar in color and size to the wild varieties found along the country roads of New England. Next to the road, the large tree trunk of a dead linden tree is decorated with vinca and English ivy as is the vault wall on this north side. A bit of woodbine has crept in here as well. The vines were added by Hans Koehler in 1935.(160)

A portion of pole fence extends in from Dudley Street, along the parking lot driveway entrance for approximately twenty feet. This is the only remnant of the fences which lined both sides of the driveway to the barn. At the terminus of this section of fence stands a black locust which Joseph Hudak planted in the 1960's.(161) He often cut pieces from the lower branches for his students, showing the thorns along the branches.

Currently neglect has taken its toll on the beauty of this area. Grass has seeded itself into the gravel. The grape vines from the fence extend into the nearby trees. Goutweed flourishes in the beds and the lilacs are

November 1914. Annual Garden and Shed. View West.

May 1931. Parking Lot and Shed. View West.

F. L. OLMSTED ESTATE

PLANTING PLAN FOR SERVICE YARD

Olmsted Brothers Landscape Architects

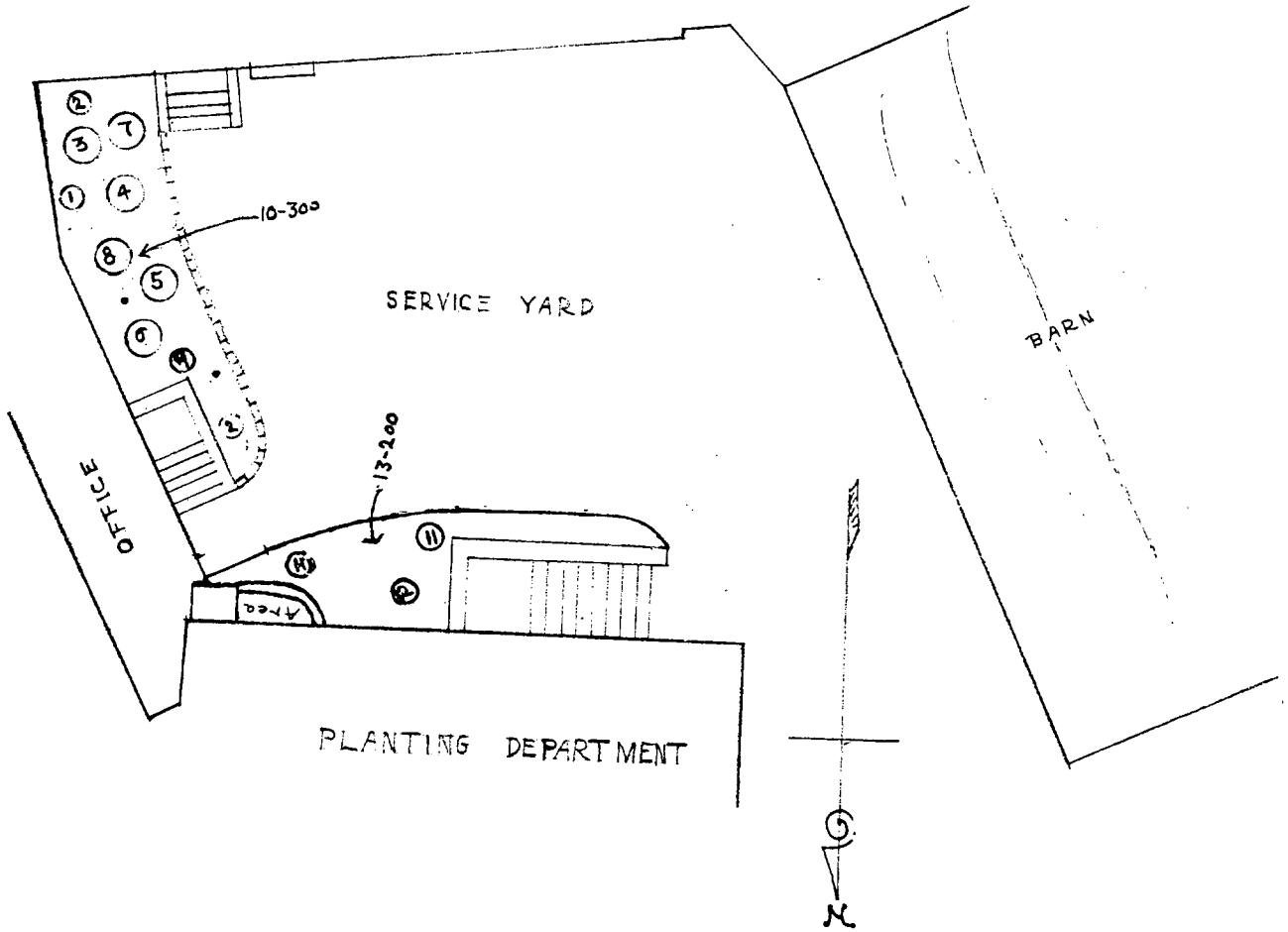
Brookline Massachusetts April 28 1926

FILE Nº 20 PLAN Nº 43

Scale 1"=10'

PLANTING LIST

1 TAXUS CUSPIDATA (Bush Form)
2 PHILADELPHUS AVALANCHE-3
3 PAEONIA OFFICINALIS RUBRA PLENA
4 " BARONESS SCHROEDER
5 " GINETTE
6 " GROVER CLEVELAND
7 " PRIDE OF ESSEX
8 " SMOUTHA
9 TAXUS CUSPIDATA BREVIFOLIA
10 PACHYSANDRA TERMINALIS



gradually succumbing to pests and disease. Serious rejuvenation work will be necessary to reclaim this area and yearly care thereafter should ensure a nicer setting for visitor parking. The beds along the parking lot may be possible heel-in areas for plants. The lilac border should be restored, then cared for each year. The flowering quince should be rejuvenated. This area is necessary for cars, but could serve as a nice setting for a visitor's introduction to the grounds.

2. Service Courtyard

When the office addition was added in 1889-1891 a small planting area was left between the fence and the addition wall.(162) A Hinoki false cypress, a threadleaf false cypress and a sugar maple were planted here during Olmsted Sr.'s time.(163) The planting department addition of 1901 further defined the area as a separate yard.(164)

Only one planting plan exists: a plan done in April, 1926. The plan indicates pachysandra, peonies, yews, mock orange and other shrubs planted along the eastern and northern walls of the yard.(165) There are no photographs indicating that this plan was used, but a Japanese yew, as indicated on the plan, remains in place today.

Little else is known about the service yard. It was used for model photography during the 1920's and 30's.(166) It became a dog run when the Richardsons lived in the house, at which time the large board gate was installed running from the northwest corner of the planting wing to the barn fence near the parking lot.(167)

Today, stones mark the edge of the planting beds at approximately the same spot where the edge of the original driveway lay. The sugar maple and hinoki and threadleaf false cypress tower 50 feet or so above the yard. An overgrown yew remains on the north side of the yard. The only other plants in the area are a small barberry beneath the false cypress and a bit of pachysandra along the south wall. No record remains of when the fence was removed.

The yard is currently used as a temporary parking area for government cars and a work area for the construction crews. Future use of this area will determine what type of planting plan may be necessary. Should the false cypress specimens be destroyed, replacement should be considered. These provide some shade to the office portions of the building and partially screen the service yard from the second floor offices. Replacement of the fence would provide screening, but may cut down considerably on the size of the useable area within the yard.

3. Office Entry Courtyard

This area was defined with the office and vault additions of 1891 and 1901. The plan for 1904 shows beds already established here and granolithic pavement used as a sidewalk material.(168) A break in the pole fence lining the driveway opened into the little courtyard. The sidewalk and bed layout remain today, but the pole fence has been removed.

The plantings for this area have been changed many times. In 1911 Hans Koehler designed a plan using tulips, narcissus, scilla, muscari, lilies, frittolaria and other bulbs along the perimeter beds and mixed anemones in the center rectangular bed.(169) He makes no mention of shrubs or vines used in the area.

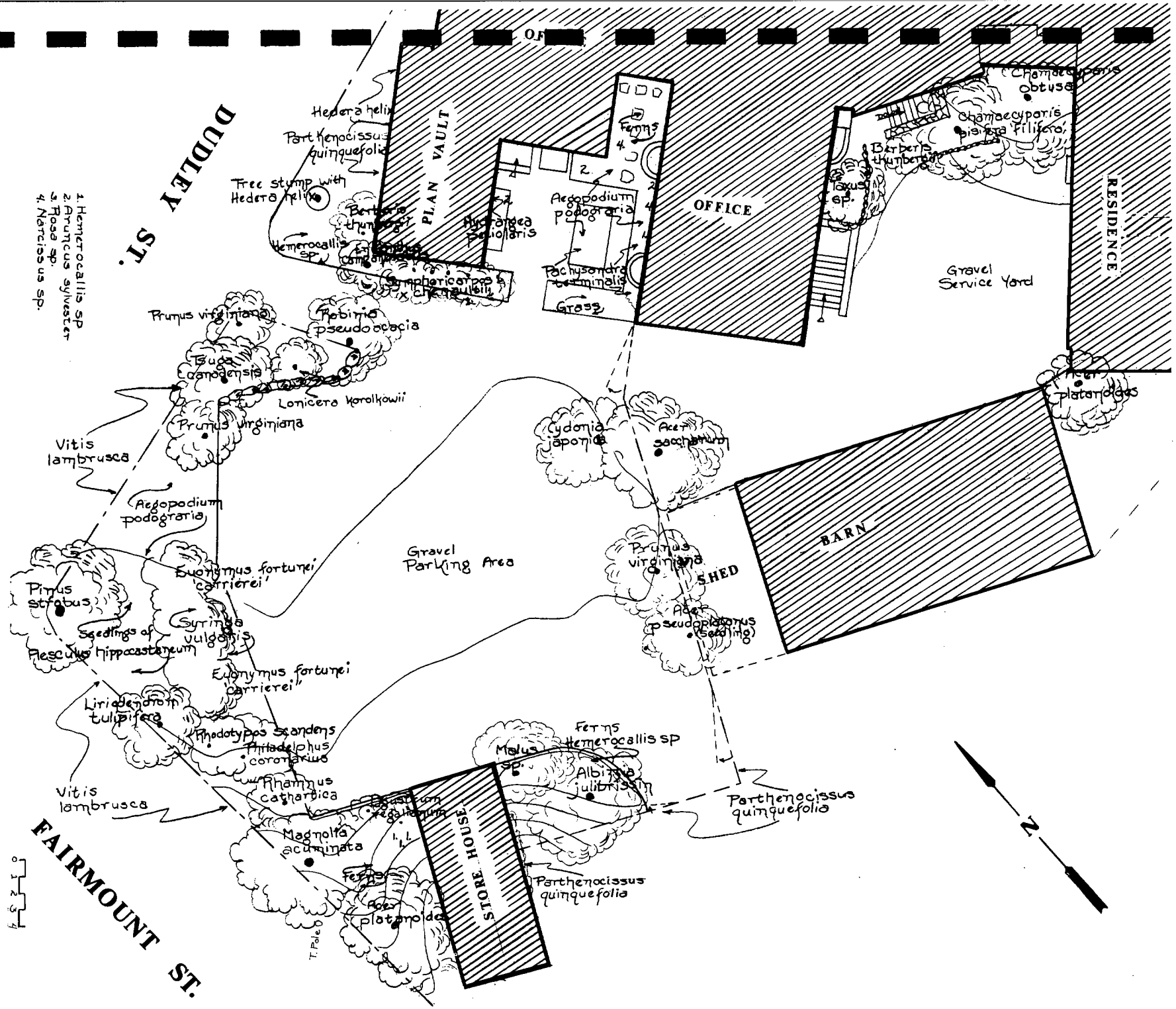
A plan for 1925 introduces rose bushes in the center bed with yews, peonies, various flowering annuals and perennials, and ground covers such as sedum and pachysandra in the border beds.(170) Photographs of the area at this time show the plan was executed.(171) This design remained until 1937. In 1935 climbing euonymus was added to the courtyard wall of the plans vault.(172)

A sketch done in 1937 describes bed preparation in the courtyard following recommendations prescribed by the Waltham Experiment Station. In this sketch the rectangular bed was laid out with fuchsia standards at each corner, pachysandra about the edge, and ageratum, begonias and geraniums in the center.(173) There are no photographs indicating that this sketch was ever implemented but this bed eventually became a thick carpet of pachysandra which remained through the 1960's and 70's.(174)

Joseph Hudak redesigned the area again in the 1950's.(175) The yews near the office door had become so large they had to be removed. Photographs taken during the early 1960's show these yews replaced with a pieris.(176) A roof was added to the door stoop in the 1960's and about this same time Mr. Hudak planted a climbing hydrangea along the south vault wall, replacing the climbing euonymus which grew on this wall for many years.(177)

Today, little remains in this area. Two large goatsbeard, a few ostrich ferns and remnants of daylilies line the border beds. The rectangular center bed is half filled with pachysandra. The remaining half contains goutweed which is a major problem in this area. The climbing hydrangea adorns more than half of the vault wall and is truely spectacular. This area will need to be replanted almost entirely to restore its former glory. The hydrangea, pachysandra and goatsbeard may possibly remain unless an exact restoration is desired. The plans that do exist are very detailed and the plant material used would not be difficult to obtain today. Serious consideration of these plans should be part of the landscape management plan. The area could be colorful and spectacular once it is restored.

Area E ~ Service Areas



No Date (1901-1926) - Rear Office Entry Courtyard. View West to Annual Garden. Note the informal plantings and the intimacy which once characterized this area.

1981 - Rear Office Entry Courtyard.
View East from Parking Lot.

IV. Problems and Solutions

Each of the problems outlined in Section III is discussed in greater detail here. Most problems were found to exist throughout the property and were not specific to a particular area. In this section each problem is identified and alternative solutions are presented. As a general rule, cleanliness and good health of all plant material should be the first line of defense behind any garden maintenance scheme. When weed, pest or disease problems do become severe, then manual or biological controls should be put into effect. Chemical spraying should be considered only as a last resort and then the least toxic compounds available should be used.

A. OVERGROWN PLANT MATERIAL

Overgrown plant material is one of the most serious resource problems affecting the Olmsted site. Many historic plants are in danger of being choked out by invasive, weedy species or by those plants which have grown out of scale with their surroundings. Vinca, ivy, pachysandra and flowering perennials which were part of earlier designs are being overrun by goutweed. Shrubs and small trees are left to compete with stands of maple, black cherry and buckthorn seedlings. Plantings which have overgrown their boundaries not only destroy the design intent, they shade out lower-growing plant material intended for the same area. Reduced air circulation in overgrown situations results in a breeding ground for pests and disease. Competition for light, water and nutrients results in reduced plant vigor and eventual elimination of the less competitive plant material. Three possible solutions exist for dealing with overgrown plant material: weeding, pruning and removal with possible replacement.

1. Weeding

A weed is nothing more than a plant which is growing out of place. Any plant can be considered a weed. Some species reseed themselves freely or spread rapidly via underground rhizomes. These species become invasive within a given area, competing with the more sensitive species for water and nutrients, eventually choking out the less competitive plants. Goutweed, blackberry and raspberry seedlings, maple, buckthorn and wild cherry seedlings, woodbine and foxgrape vines have become weed problems on the Fairsted grounds. Though these species can be attractive when kept under control, they must be eliminated when found growing out of place.

Goutweed control is not a recent problem. A letter from Frederick Jr. to Mr. Gardner in 1933 indicates that this plant was difficult to control then:

> Along both sides of the old wall which separates your place and mine there has been for many years a gradually spreading infestation of goutweed. It is a pretty ground cover, but a devilishly persistent and slowly but indefatigably spreading weed. The plant was introduced on our place many years ago by my mother; much to her subsequent regret because of the difficulty of keeping it within bounds. After a good many years it spread from our side to your side of the wall, where it now has practically complete possession of an area more extensive than I like to think about. Of late I have, as a mild form of exercise, addressed myself to the task of eradicating it on my side of the wall, going over the ground again and again as new shoots spring up from fragments of the underground runners missed on previous weedings. I have hopes that by keeping this up at intervals for a year or two or so, I can ultimately get rid of it for good and all; but only if the same treatment is applied to the now much larger patch of the weed on your side of the wall. If I have your permission I will tackle the latter as opportunity serves from time to time though I can make no predictions as to when, if ever, I shall be able to complete the task so that the last fragment of runner and the last seed will be gone and a new outbreak can no longer be feared.(178)

Weed control can be accomplished in a variety of ways. Manual control is effective when the time and help are available. For complete elimination the gardener must be certain to pull out the entire plant including all underground portions. This may be effective with tree seedlings and vines, but manual control has little effect on goutweed and blackberry or raspberry seedlings. Often these species return three weeks later growing more vigorously than before.

The availability of money and labor for grounds maintenance at Fairsted is limited. Use of an herbicide in suitable areas would reduce heavy weed infestation problems and allow more effective use of manpower. The Arnold Arboretum has recommended the use of Round-Up, a post-emergent herbicide developed by Monsanto Corporation. Until the development of this product a post-emergent herbicide was not available that would break down into soluble organic components after application. This breakthrough allowed for use of an herbicide near desired plant material without harmful effects and allowed for immediate replanting of cleared beds. Manual weeding is recommended on the majority of weed species at Fairsted. Use of an herbicide is recommended only on those weeds which are difficult to control, such as goutweed and raspberry canes.

Round-Up has been effective for post-emergent weed control in gravel areas along roadsides and in many nursery and arboretum maintenance programs. This herbicide is also available in diluted form from Ortho, under the name Clean-Up. Either form is effective on all plant material when applied to the leaves. The herbicide is translocated throughout the plant and forms a barrier in the food production processes, eventually starving the plant. The treated plant whithers and dies within 10 days and can be raked away or left in place to be broken down as mulch. The herbicide is broken down in the soil within a week and replanting can take place almost immediately. Herbicides can be sprayed on large areas such as the driveway, where there are no other plants, or applied with a paint brush or cotton glove* to weeds growing among other plant material. Round-Up was applied on an experimental basis to unwanted grass, goutweed and tradescantia in the front driveway, hollow path and parking lot at Fairsted during the study period. It proved effective on all plants in these areas and no problems were noticed of it affecting other plants. To date, Round-Up is known for having no long-term effects.

Black plastic and black felt matting can be laid under plants as alternate forms of weed control. This method may be unsightly, unless covered with a thin layer of soil or mulch, and care must be taken to ensure proper water penetration to the soil, especially in the case of the black plastic. For large areas with plants laid out irregularly this method may not be practical.

Crowded plantings, especially in perennial borders and herb gardens, have been effective in lessening weed problems. This method suggests that intended plants set close together allow no room for weed invasion. Care is necessary in maintaining the size of plants and in choosing the correct combinations so that each intended plant does not overshadow the others.

Weed elimination is not practical in many areas until plans for replanting the beds are made. For instance, efforts to eliminate goutweed in the front circle should not be undertaken until plans are made to replace the original groundcovers (pachysandra, ivy and vinca). In all cases weed problems become lessened when the intended plantings are healthy and full as weakened plants are more likely to succumb to weed invasion than healthy ones.

A combination of the above methods will, most likely, prove to be the most effective means for weed control at Fairsted. Allowances for weed control have been included in the maintenance schedule in Section V.

2. Pruning

Pruning is a necessary part of any cyclic maintenance schedule. It is also a major portion of any landscape rejuvenation or restoration plan, especially in the first two to three years of rejuvenation efforts.

*note: A cotton glove worn over a heavy plastic glove on the hand can be soaked with Round-Up and touched to the leaves of weedy plants.

Tree pruning is generally necessary only for control of disease or for removal of interfering limbs. Pruning of most deciduous trees can be done at any time, but often pruning is scheduled for late winter (February and March). In this way the tree has the benefit of a full growing season to develop and recover from the pruning before fall frost. The new flush of spring growth will quickly cover the pruning cuts and lend a more pleasing appearance to the plant. Birch, dogwood, elm, maple and yellowwood are heavy "bleeders". Clear sap will run from pruning cuts in excessive amounts if these trees are pruned in late winter. Often this bleeding will stop after the leaves develop. This condition does not harm the tree extensively, but often causes concern to the tree owner. If preferred these trees may be pruned in early summer.

Pines and other needle-leaf evergreens whose branches radiate in whorls from the trunk may be pruned in late winter, in spring before new growth begins or in mid-summer. Evergreens such as arborvitae and false cypress, whose branches grow haphazardly from the trunk, may be pruned at any time. Late summer shearing, however, may produce new growth which is susceptible to frost injury.

Trees and shrubs which set their flower buds in the summer or early fall for the following spring should be pruned immediately after flowering in the spring. Should these species be pruned in the winter months, few flowers would appear that spring. Trees and shrubs in this category include flowering dogwood, flowering crabapple, lilac, flowering cherry, magnolia, forsythia, mock-orange, rhododendrons etc. Trees which set their buds on the current seasons growth such as summersweet should be pruned in late winter or early spring. This encourages new growth and better flowering.

Those plants which are members of the rose family (apples, crabapples, firethorn, hawthorns, etc.) are subject to a disease known as fire blight. The disease is spread upon contact with an open wound. When infested, the plant appears to be black and sooty, as if it had been scorched by fire. It is recommended that all pruning equipment be sterilized in ethyl alcohol before pruning to lessen the possibility of disease transmittal.

When severe pruning of shrubs is necessary, as will be the case in the first year at Fairsted, cutting back to the ground the more vigorous species will insure healthier plant development in the future. This measure is drastic and should be attempted <u>only</u> on more vigorous species. This method was implemented with the rhododendrons along the southwest bank of the hollow during the study period. These shrubs had become so overgrown that only top growth remained on the branches. The plants were cut to the ground with the exception of a few lower branches which could maintain the food supply while the shrub was developing new basal shoots. The shrubs were fertilized and new growth appeared at the base of each plant within a matter of weeks. This method of rejuvenation should be done early in the growing season (before July 15th) so that the plants have sufficient time to grow and harden off before the fall frost. Plants which will tolerate such severe pruning include: jetbead, most viburnums, honeysuckle, deutzia, mock-orange, lilac, rhododendrons and some azaleas.

Large overgrown evergreens (i.e. yews) may require more than one season to rejuvenate after serious pruning. The yews in the hollow were thinned to allow light to penetrate the center of the shrub. As new growth begins along the center branches, the large outer branches will be pruned back. Over a period of three to four years these shrubs can be rescaled to their proper size.

Pruning of shrubs for yearly or biennial maintenance requires simple removal of dead or older branches and removal of any crossing, injured or diseased limbs. Up to one-third of the shrub can be pruned at one time. When pruning display plants which are continuously seen by the public, it is best to prune all limbs and shoots with an angled cut which slopes away from the view of the path. In this way the cut is less noticeable and a more naturalistic effect is maintained.

3. Replacement

When pruning does not seem feasible or if a plant has been lost completely, replacement may be necessary. In an historic landscape, one should replace a plant with one of the same species and/or cultivar if the original plant was lost through age or natural disaster. It is generally not advisable to consider identical replacement if the original was lost to pest or disease as these problems would most likely attack the replacement plant.

If an identical plant is not available commercially, it may be necessary to propagate the species from the plant being removed. Ideally, this should be done two to three years or more before replacement to insure a rooted cutting of fair size. When a greenhouse is not available for propagation, a temporary mini-greenhouse can be constructed from a long wooden box with clear plastic, arranged on wire, over the top. Cuttings can be rooted in this box, then potted and transferred to a cold frame or protected heel-in area on the property. Protection over the first winter is very important. The ideal time to take cuttings will vary with the species.

In particular cases, new cultivars or strains of a species have been developed for increased vigor, disease resistance or superior flowering and fruiting characteristics. The cultivars will not be historically correct, but will provide the same form, texture, size, shape and landscape effect as the original. Should a replacement of this type be used, the public should be informed of the change and the reasons for selecting the new strain or cultivar.

The American elm in the middle of the south lawn is probably the most important plant requiring careful replacement consideration. This tree is currently in good health but it seems inevitable that this tree will succumb to Dutch elm disease. When the elm dies, another specimen tree should be selected which combines the form, texture and color characteristics of the elm. A honey locust was planted behind the barn in the 1960's as an eventual replacement for the elm. New disease resistant strains of American elm are also available as well as zelkova and Chinese elms. All have been used as suitable replacements. No expense should be spared in caring for the elm or in its eventual replacement. Further information about the care and replacement of American elms is available in the Olmsted National Historic Site files.

When an exact cultivar/variant replacement is not available, a substitute plant may have to be used. Before selecting a replacement, the time frame being represented in the landscape, the effect or purpose of the original plant and the reason for the death of the original plant should be considered. Replacement candidates should be judged by their ultimate height, texture, form, disease resistance and overall similarity to the original plant. Proper replacement means selecting the best species available commercially which makes the least compromise of these considerations. A list of replacement alternatives for specimen or valuable plants currently part of the Fairsted landscape is contained in the appendices of this report.

B. SOIL CONDITIONS

A concentrated effort at soil improvement would greatly enhance the performance of the plant material on the site. Poor soil composition can interfere with nutrient exchange and water transmission. Compaction of the soil and improper pH can inhibit the water and nutrient uptake of the plant and inhibit plant root development. Lack of nutrients within the soil make plant development close to impossible.

Fertilizer and soil amendments have not been applied to the Fairsted grounds over the past five to ten years. These amendments should be regularly scheduled and soil samples should be taken each year until the proper pH and nutrient levels are obtained. Then soil checks should be made every other year. Soil tests are available from the Suburban Experiment Station for a nominal fee. A chart at the end of this section summarizes soil improvement recommendations for next year. These recommendations are based on fourteen soil test samples taken during the study period.

In most cases test results showed the soil to be highly acidic. pH is a measure of soil acidity: pH 7.0 is considered neutral, pH 0.-6.9 is acid and pH 7.1-14 is basic or alkaline. Proper pH allows the optimum availability of nutrient ions for plant uptake. The optimum soil pH for most plants is between 5.5 and 6.5. Rhododendrons, azaleas, mountain laurel, pieris and summersweet are acid-loving plants and do best in soils with a pH between 4.5 and 5.0. Most of the soil pH at Fairsted is between 4.0 and 5.0. Applications of lime each spring will neutralize soil pH in those areas of the grounds without acid loving plants. The Suburban Experiment Station recommends lime applied at the rate of 200 lbs. per 1,000 sq. ft. When the soil pH is above 6.4, no lime is recommended.

Nutrient levels in most cases were somewhat low. Application of manure, leaf mold, mulch and other organic materials would increase soil nutrient levels and soil texture thereby increasing the exchange of soil elements and water transmission. Application of organic fertilizers also has the advantage of loosening soil composition. When applied to clay or sandy soils, the organic matter loosens the soil particles, allowing better water filtration, nutrient exchange and root-growth of the plants. Applications of inorganic fertilizers should augment these organic additives in limited amounts for the first few years to return the soil to a more productive state. Then they could be applied as necessary in later years to maintain proper nutrient balance.

Whether organic or inorganic sources of fertilizer are used, plants need specified amounts of macro and micronutrients for proper growth and development. Macronutrients, needed by plants in large amounts, include nitrogen (N), phosphorous (P), potassium (K), calcium (Ca) and magnesium (Mg). Micronutrients needed in minute quantities include zinc, boron, manganese, copper, iron and others. These micronutrients can be toxic to plants when present in large amounts and are often applied with supplemented inorganic fertilizers. Special application of these micronutrients is not recommended unless plants show deficiency symptoms, which is not the case at Fairsted.

Proper levels of nitrogen encourage leaf and new shoot growth and development. Nitrogen levels are measured by the available nitrate and ammonium ions present in the soil. Nitrates are highly leachable, therefore during warm rainy periods, less nitrogen may be available to plants than in cooler drier seasons. When large amounts of fertilizer are applied, the material is broken down into ammonium ions which are later broken into available nitrogen (nitrate ions) for plant consumption. When an excess build-up of ammonium ions occurs and these ions are not rapidly converted to nitrate ions, plant tissue can be 'burned'. For this reason it is inadvisable to apply too much fertilizer at one time.

Phosphorous is used for root and shoot development. Phosphorus, therefore is very important early in the season and on newly set trees and shrubs to encourage rooting. Potassium is important for flower bud set and is especially important for those plants valued for their flower production. The quantity of nitrogen, phosphorus and potassium are identified in inorganic fertilizers as a series of three numbers (24-8-10, 10-10-10, etc.). These numbers represent the amount of the nutrient available, as a percent, per pound of fertilizer applied. Grass requires high amounts of nitrogen and lower quantities of phosphorous and potassium since leaf growth is prime. Flowering trees, shrubs and annuals require less nitrogen and more potassium for better flower production. When fertilizer is applied to a mixed border or bed, an all purpose fertilizer such as 10-10-10 or 20-20-20 is applied.

Soil tests for Fairsted showed high concentrations of lead in certain areas of the grounds. The herb and vegetable garden, the rear courtyard, and the front planting beds next to the house on both sides of the front door were especially high. Extension agents recommend growing no edible crops in these locations. If edible crops are grown, only fruiting varieties (i.e. cucumbers, tomatoes, squash, eggplant, etc.) should be grown for consumption. High accumulations of lead appear especially in the leaf portions of a plant and therefore plants grown for their leaves should not be eaten (lettuce, cabbage, spinach, etc.). These high levels of lead appear in those areas abutting the house and office buildings. The lead has accumulated over time from the lead paint used on the building exteriors. Soil replacement is the only method currently available for eliminating lead concentrations in the soil.

The following chart outlines soil improvement recommendations for Fairsted. All recommendations are based on fourteen soil test samples taken during the study period. Soil sample numbers refer to the test results found in the ONHS files. The other headings within the chart are explained at the bottom of the page.

EXISTING SOIL CONDITIONS

The following chart outlines soil improvement recommendations for Fairsted. All recommendations are based on fourteen soil test samples taken during the study period. Soil sample numbers refer to the test results found in the ONHS files. The other headings within the chart are explained at the bottom of the page.

AREA	SAMPLE NUMBER	pH	SOIL TEXTURE	PERCENT SATURATION	NUTRIENT LEVELS MACRO	NUTRIENT LEVELS MICRO
HOLLOW	1, 3, 14	4.3 - 4.6	clay, organic matter	very low 8.1% 19.3%	low	low
FRONT DRIVEWAY	6, 8	4.7	sandy loam to loam	very low 18.-35%	low - medium	medium
ROCK GARDEN	5, 10	4.2 - 4.8	loamy clay	very low 8-26%	low	medium
LAWN	2	4.6	loam	very low 18%	high	low - medium
SHRUB BORDER	9	4.3	clay, organic matter	very low 16.5%	medium - high	low - medium
HERB AND VEGETABLE GARDEN	13	5.4	loam	medium 51%	high	medium
ROSES AND PEONIES	12	5.6	loam	medium 50%	medium - high	low
GRAPES	7	5.4	loamy clay, organic matter	medium 50%	high	low - medium
PARKING LOT	11	5.2	sandy loam	medium - high 55%	medium - high	medium
REAR ENTRY COURTYARD	4	5.1	clay, high organic matter	low 34%	low - medium	medium

pH: A measure of acidity:
pH 0.0 - 6.9 = acidic; pH 7 = neutral; pH 7.1 - 14.0 = basic (alkaline);
Most plants prefer pH 5.5 - 6.5; Acid loving plants prefer pH 4.5 - 5.0.

Soil Texture: Determined by the cation exchange capacity (C.E.C.) of the soil. Soil texture determines the rate of nutrient and water transmission within the soil. C.E.C. = 0.0 - 5.0 meg/100 g soil = very sandy soil with low organic matter. Small amounts of limestone will be required to change the pH level. C.E.C. = 20.0 - infinity = soil high in clay or organic matter. Large amounts of limestone will be required to change the same pH level as above.

Percent Saturation: Relative concentration of potassium (K), magnesium (Mg), and calcium (Ca) ions. These ions replace hydrogen and aluminum ions within the soil, lowering soil acidity. The sum of the K, Mg, Ca percentages should fall between 73% and 100% as follows:
K = 2.0 - 5.0%; Mg = 6.0 - 12.0%; Ca = 65.0 - 85.0%

LEAD LEVEL	RECOMMENDATIONS
low - medium	Apply 2-4 in. mulch or compost in fall. Apply 20 lbs. ground limestone per 100 sq. ft. to all areas except those supporting rhododendrons or azaleas. Apply 1-2 lb. 10-10-10 fertilizer with supplements per 100 sq. ft. to all areas.
medium - high	The bed next to the house which is not supporting any growth contains high levels of lead, copper and iron. Roof drainage must be corrected in this area before this bed can support any plant growth. Apply 20 lbs. ground limestone per 100 sq. ft. Apply dolomitic limestone to beds at house front. Apply 2-4 in. of organic matter to all beds. Apply 1-2 lbs. 10-10-10 fertilizer per 100 sq. ft. to all areas.
medium	Apply 20 lbs. dolomitic ground limestone per 100 sq. ft. to all areas but those supporting acid loving plants. Apply 1-2 in. of organic matter to all beds. Apply 1 lb. 10-10-10 fertilizer per 100 sq. ft. to all areas.
low	Apply 20 lbs. ground limestone per 100 sq. ft. in split application (September and April). Apply fertilizer to supply 2 lbs. nitrogen per 1,000 sq. ft. (20 lbs. 10-6-4 fertilizer).
medium	Apply 20 lbs. ground limestone per 100 sq. ft. (except acid loving plants). Apply 1-2 lbs. 10-10-10 fertilizer per 100 sq. ft. if desired (most nutrient levels are acceptable at this time, therefore, this application is optional).
high	Do not eat leafy crop vegetables from this garden because of high lead levels. Replacement of the topsoil will be necessary if this is to continue as an herb and vegetable garden. Apply 20 lbs. ground limestone per 100 sq. ft. Apply 1-2 in. compost or mulch as desired. Nutrient levels are acceptable at this point, therefore, application of fertilizer is optional.
low	Apply 20 lbs. ground limestone per 100 sq. ft. Apply 1 lb. 10-10-10 fertilizer with supplements per 100 sq. ft.
medium	Apply 20 lbs. ground limestone per 100 sq. ft. Apply 1-2 lbs. 10-10-10 fertilizer with supplements per 100 sq. ft.
medium	Apply 20 lbs. ground limestone per 100 sq. ft. Apply 2-4 in. of organic matter to beds. Apply 1 lb. 10-10-10 fertilizer per 100 sq. ft.
high	Apply 20 lbs. ground limestone per 100 sq. ft. Apply 1-2 lb. 10-10-10 fertilizer per 100 sq. ft. Do not eat any leafy crops planted in this area. Replacement of the topsoil may be necessary if plant growth suffers from high lead levels.

Nutrient Levels:	Macro: N, P, K, Mg, Ca ion levels were measured on a scale from low to very high. The chart indicates median levels of these nutrients. Micro: Bo, Al, Fe, etc. were measured and compared to the average soil range for each nutrient. These substances can be toxic at high levels, so the addition of these nutrients is not recommended unless plants show deficiency symptoms. When all micronutrient levels appeared low, the addition of a supplemented fertilizer was recommended.
Lead Levels:	Exact lead levels are given with each test result in ppm. Low - follow good garden practices. Medium - refrain from growing leafy and root crop vegetables. High - grow only fruiting crops; replenish soil with clean topsoil or garden in containers. Very high - grow only ornamental plants and flowers; replace all topsoil or container garden.
Recommendations:	Never apply more than 4 tons ground limestone per acre (20 lbs. per 100 sq. ft.) per year. Fertilizer recommendations are based on 10-10-10 fertilizer analysis. If another inorganic analysis, or organic fertilizer is used, adjust accordingly for application amounts (see appendices).

C. PESTS

Pest problems vary over time with the plant material, weather conditions and pest populations. However, certain pests can be expected with some regularity and controls for these should be part of a yearly maintenance schedule. In some cases, a pest will not become a serious problem until a population imbalance occurs.

Concern has arisen recently over the harmful effects of spray chemicals on other forms of wildlife. Strict Federal regulations and efforts by chemical corporations have resulted in less harmful products on the market. Despite this progress, chemical pesticides should be used only as a last resort in controlling damaging insects. Organic sprays, natural enemies and alteration of cultural practices should be employed before resorting to chemical controls.

When chemical controls become necessary, advice from the Massachusetts Department of Agriculture and the Suburban Experiment Station should be sought and the most recent list of approved pesticides should be consulted. As new products come on the market and the hazards of previously approved products become known, the listings of approved pesticides will change. Proper application of any pesticide, according to label directions, will further reduce any possible hazards.

The following paragraphs outline alternative solutions to pest problems encountered at Fairsted during the study period. Each discussion includes a description of the pest, evidence of the problem, plants affected (generally) and alternative solutions. Any pesticides listed here are approved safe for 1981 by the Massachusetts Pesticide Control Board. A brief description of each pesticide listed is included in the appendices of this report.

1. Animals

Rabbits, mice, woodchucks, squirrels, skunks and raccoons, all present on the Olmsted site, can each damage tender new growth in their own way. Often these animals can be repelled by fencing, chemical repellants or by transferring them to another location. Deer, rabbits and mice will girdle trees in a severe winter when there is nothing else for nourishment. Providing an alternate food supply or wrapping new trees with a paper covering will often deter animal attack. These animal problems will be specific to a given area and alternatives are available for dealing with each problem. Little damage of this type has occurred at the Olmsted site to date and no corrective action is currently necessary.

2. Aphids

Aphids are sucking insects which attach the leaves and soft tissue of trees and shrubs often producing galls and disfiguration on the leaf surface. Unless occurring in very large numbers, these pests are more of a problem aesthetically than they are harmful to the plant. Aphids often are primary suspects in transmitting disease, therefore the eradication of aphids will aid in disease control when symptons occur. The honeydew secreted from the aphid covers the leaf surface as a glossy, sticky mass and is often a

host for sooty mould. Aphids caused a moderate amount of damage this year to birch, black cherry, maple and other tree species. Sooty mould was troublesome on some species of azalea and viburnum. There are many species of aphid which are specific for particular plants: i.e. the European Birch Aphid (Euceraphis betulae), the Norway Maple Aphid (Periphyllus eyropictus), etc. When the infestation is serious, malathion is recommended in early summer only for specimen or severely threatened plants. Control of aphid infestations is often extremely difficult due to the large size of the population. Sometimes more than one spray application is necessary.

3. Borers

There are many species of borers, most of which are merely the larval stage of an insect. Borers generally attack weakened trees and shrubs, depositing their eggs in scar tissue or under the bark surface in spring, summer or fall depending on the species. The larvae leave tiny holes in the bark, generally at the junction of a branch and the trunk or within scar tissue itself. The best prevention lies in keeping the tree in a healthy state. Proper fertilization, pruning and watering should prevent borer infestations. Malathion or methoxychlor, injected into the bark of the tree during the adults egg laying period or before the eggs hatch is also effective. In addition, spraying for the adult insect or painting the exterior bark of the tree with insecticide may be effective when done at the proper time (depending on the insects life cycle). Borer damage has been minimal this year at the site, the lilacs being the species most affected. No spraying was necessary. Proper fertilization and plant care should be a major concern for the lilacs in the future.

4. Cottony Aphid

Although aphid by name, this pest is unrelated to the aphids described above. White cottony masses of this pest were found on the flame azalea on the south lawn. These pests are more aesthetically unpleasant than harmful, but severe infestation can cause dieback and weakening of the infested plant. Control is difficult, as these pests overwinter in cracks and crevices of the bark and are protected by their white woolly covering throughout the summer months. Where these pests are a problem, they can be sprayed with a systemic pesticide or a pesticide such as malathion early in the growing season. Some promising results have been obtained by spraying with a mild soap and water mixture before the leaves emerge. Low concentrations of soap are preferable and some experimentation is necessary, as some plant leaves are damaged by the soap solution. The azalea should be treated during the month of June.

5. European Elm Bark Beetle

This pest is the known carrier for the dread Dutch elm disease. The female deposits her eggs in the dead or weakened wood of an elm. The larvae hatch and tunnel out from the egg deposit at right angles from the nest throughout the sapwood. As adults, these beetles feed on healthy leaves, and to some extent on new twigs and buds, infesting the healthy tissue with

Dutch elm disease. Prevention is the best control for this pest. Burn all dead or heavily weakened wood to eliminate nesting sites. Spray healthy trees with methoxychlor in late April or early May. Fertilize and care for healthy trees to encourage vigor and reduce susceptibility to the pest and disease. These precautions are currently in practice on the Olmsted elm.

6. Galls

Galls are most prevalent on oaks, but can occur on other plants as well. A gall is an enlarged and enclosed growth surrounding a branch or twig. They are formed by mites and other insects which grow and feed inside the plant tissue. Life cycles of these insects vary with the species but in general the insects overwinter on trees or on the ground and in spring the adults travel to the leaves and twigs where they deposit their eggs. The young hatch from the eggs and mature inside the galls. Most gall insects do not harm the vigor of the tree. In those species where this is a possibility the plant can be protected by spraying with a dormant miscible oil or dormant lime sulphur spray. Valuable trees can also be protected with a methoxychlor - kelthane spray in mid-May and mid-June. This is not currently necessary at Fairsted. Heavily infested branches should be pruned and burned before the adults emerge. Species affected by galls this season include the red oaks, sweet birch and some viburnums. Damage from galls has not been severe, and no action is recommended at this time.

7. Gypsy Moth

1981 was an extremely severe year for infestation of this pest. Large numbers of acres of deciduous trees and shrubs throughout the northeast were defoliated by the gypsy moth caterpillar in May and June. The caterpillars are up to three inches long, hairy, grey with pairs of red and blue dots running down their backs. Many towns, including Brookline, sprayed for control with Dipal, a biological agent which kills the caterpillar in its first stage of development.

A naturally occurring viral disease often attacks gypsy moths when their population has reached a stage where competition is tight for food. The population will build for three to four years, then this viral attack is effective enough that another build up does not occur again for a number of years. Another enemy, gypsy moth parasites, which are the larval stage of wasps and flies, can keep a moth population in check when the population is low. Eventually, however, these parasites cannot keep the increasing population under control. Hand picking of the gypsy moth egg masses or painting the mass with creosote (if not on a tree) or kerosene may help population control, but to a very limited extent. The same is true for sexual attractants and rings of foil or Tanglefoot around a tree trunk. Very often these controls do more to reassure a property owner than in actual control of the gypsy moth population.

Chemical sprays used to control gypsy moths include methoxychlor, carbaryl (Sevin) or arsenate of lead. Since these may also kill bees and other beneficial insects, non-chemical controls are preferred, such as the bacterial and viral biological agents previously mentioned. Though no trees

at Fairsted were completely defoliated this season, gypsy moth populations were fairly high and damage to many varieties of trees and shrubs did occur. No spraying was done this year. Spraying of biological agents on residential properties is recommended for heavy infestations on valuable trees. This should be considered when very high populations occur and complete tree defoliation is a threat. Spray companies are often overbooked during this period so early detection and spray scheduling is important. See FLONHS files for further details.

8. Japanese Beetles

These pests may appear in great numbers during July and August throughout the east coast. Japanese beetles have iridescent bluish-green bodies and can be found most often on rose bushes, though they often affect grapes, elms, lindens, dahlias and zinnias. The beetles chew large holes in the leaves and blossoms of these plants. The Japanese beetle grub is born in lawns and other grassy places during July and August. Soon after hatching the grubs feed on grass roots; when 25 or more are found in a square foot of sod, they will undoubtedly kill the grass. A milky disease spore powder, sold as DOOM, contains spores of a bacterium that will kill Japanese beetle grubs. Applications of this product can occur at any time of year and the spores will live in the soil until the grubs appear. The grubs are most affected, however in spring and fall. Several years are generally necessary for the spore population to increase large enough to effectively reduce the grub population. This control is currently unnecessary at the site. On ornamentals, Japanese beetles can be manually controlled by hand picking the pests into cans containing kerosene and water. Obviously this is only effective for small scale problems. Sprays containing Sevin, chlordane or methoxychlor plus a miticide have proven most effective for large scale infestations and for problems on large trees and shrubs, but this is not recommended for the current extent of the problem at Fairsted. Grapes, roses, zinnias and peonies suffered moderate damage from these pests during the study period. Manual controls have been effective in keeping them in check.

9. Scale

Like aphids, there are many kinds of scale, each specific to a group of host plants. Scale often appears along the twigs and stems of trees, shrubs and groundcover. The pests are small, often white or grey, and enclose themselves in hard casings. During the crawling stage (generally the first two weeks of June), scale is more susceptible to spray controls. Some species of plants will be killed by heavy infestations of scale. Scale insects suck plant juices, reducing plant vigor. They occur on a wide range of plant material. Rhododendrons, yews, pieris and many other shrubs are susceptible. Pachysandra, bittersweet and euonymus are particularly susceptible to the euonymus scale (Unaspis euonymi). Scale on all plants can be controlled by application of a dormant oil spray in late March or early April. This heavy oily covering smothers the insect. Often summer spray measures are necessary as well during the crawling stages of the pest. Malathion, Sevin or dimethoate (Cygon) are generally effective. A soap and water mix as a dormant oil spray just before June may be

effective, as well as a lime, sulphur and miscible oil spray. Yews, rhododendrons, azaleas, and similar shrubs were infested with scale in 1981. Damage due solely to this insect was difficult to evaluate. A soap spray should be applied next year to infected plants.

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These pest problems appeared during the 1981 study period. Other problems may be present. References are available for descriptions and diagnosis of pests. When one is not certain of the pest problem, samples of infected plant material or a sample insect may be sent to the Surburban Experiment Station for diagnosis and recommendations for control.

D. DISEASE

Disease problems were abundant during the study period. The same maintenance philosophy applies for both pests and diseases: a healthy plant under good growing conditions is less likely to succumb to severe attack (prevention is the best cure). When control measures are required, biological or organic controls should be the first alternative. Sprays should be considered only as a last resort. In some cases diseases are spread by insects or other pests. These may be controlled by eliminating the pest itself. Alternative solutions are outlined within each discussion.

1. Black Spot

The grapes surrounding the pool and the roses along the terrace were severely infected with black spot fungus. The leaves and fruit showed evidence of a tiny black or brown spot which spread and caused leaf defoliation and fruit drop. The fungus produces ethylene gas which causes this premature ripening and defoliation. The mycelium of black spot grow under the protective covering of the leaf or fruit. Therefore, fungicides cannot kill the fungus without killing the leaf or fruit. Prevention is the best means of cure in this case. Susceptible plants shoule be sprayed from the beginning of the growing season with any one of a number of fungicides to protect the young leaves and fruit against the initial invasion of the fungus. This spray program should be maintained throughout the season, according to spray schedules outlined by the U.S. Department of Agriculture. The fungus overwinters in the dead leaves, fruit and living canes of the plant. Proper sanitation, including the raking and burning of infected plant parts, along with severe pruning (without injuring the plant) will further prevent the spores from contacting new growth the following year. Fermate, Ferbam, Maneb and Captan were fungicides recommended this year by the Massachusetts Department of Agriculture. Captan was applied this season. This fungicide is often used to wash down hospital rooms for patients allergic to fungi. It therefore was recommended as the least harmful spray for use near the pool.

2. Canker

Many species of fungi attack the bark and twigs of trees and shrubs, causing fissures and splitting of the bark tissue (cankers) to develop. Previous injury or weakened wood provide an access for the fungus. As the

parasite spreads, a thick callus develops at the edge of the canker, indicating the tree is overcoming the infection. Death of the plant results when trees are girdled. Cankers on the branches or outer twigs may be pruned and burned to prevent further attack. Attention to young growth, where cankers most often develop, is advisable. Those trees severely affected should be destroyed. The best cure is prevention: keep plants well fertilized and watered and protect from outside injury whenever possible. Some sweet birch seedlings at the site are currently suffering from canker infestation. Improved cultural methods should effectively reduce this problem in the future.

3. Dutch Elm Disease

This fungus disease has proved fatal to American elms across the United States. The fungus is carried to the tree by elm bark beetles as they feed on the young bark of a healthy elm. The fungus grows submerged in the sap of the tree and is transmitted throughout the tree with the flow of water and nutrients in the sap. The leaves of the elm hang down or wilt, then curl and dry out. Very often, one side of the tree is affected first. Immediate action is necessary once these clues are recognized.

Drastic pruning of the infected branches, if done early in the infestation, may check spread of the disease. Some trees may die in one year, but older trees may take many years to die. The fungus may be spread along root grafts which are common among street trees or when growing and spacing conditions are close. The disease overwinters in dead and dying elms, as do the larvae of the elm bark beetle. Destruction of this dead elm material prevents over-wintering of the spores and is very effective in disease control.

Proper care of healthy elms, including a preventative spray schedule will deter the disease infestation. There is no cure for infected elms. Proper preventative measures are the only means of fighting the disease. The tree is checked yearly by an arborist for necessary pruning and is sprayed in April and June with a methoxychlor/malathion spray. Protection from mechanical injury and proper water and fertilization practices will further protect the vigor of this tree.

4. Phloem Necrosis of Elm

The symptoms for this disease are very similar to those of the Dutch elm disease: dropping and curling of leaves, followed by yellowing and browning of the leaves, then early defoliation resulting in the eventual death of the tree. Proper diagnosis is based on the color and odor of the inner bark: the thin layer of inner bark in contact with the sapwood becomes yellow/butterscotch in color, with the distinct odor of wintergreen. The disease is transmitted to the elm by the white-banded leaf hopper. Two applications of methoxychlor emulsifiable concentrate (not wettable powder) in June when the spring leaf crop is mature and in late July after the second growth of elm leaves has occurred, will effectively control the leaf hopper. The spray for control of phloem necrosis is only effective on healthy trees.

Little can be done once a tree is infected with the mycoplasm. For continuous protection, trees must be sprayed each year. This spray program should be incorporated with that for the elm bark beetle as has been done at Fairsted. Good sanitation procedures are again as important for this disease as for Dutch elm disease. The spores of both diseases overwinter in dead elm material.

5. Powdery Mildew

This fungus appears as a white powdery covering on leaves of infected plants. It often appears in hot, humid weather or in areas receiving a great deal of rain in the summer months. The combination of heat and moisture encourages spread of the mycelium. During the study period, downy mildew appeared on the lilacs, azaleas and rhododendrons during July and August. The fungus is superficial as the mycelium does not penetrate the outer layer of leaf tissue. The disease is not considered harmful, but may be undesirable on specimen plantings. Plants can be sprayed with benlate, daconil, wettable sulphur or Acti-dione PM. This is not currently necessary at Fairsted. Some microscopic animals, not visible without the use of a hand lens feed on the mycelium and can be used as control (i.e. the larvae of Chaetopsis). Snails also feed on the mycelium often leaving attractive track patterns on the leaf surface.

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Further information on diseases and pests of ornamental plants and their controls are available from the Suburban Experiment Station, the Massachusetts Department of Agriculture, the Arnold Arboretum and those books suggested in the selected bibliography at the end of this report.

V. Recommendations

As discussed in the introduction, the purpose of this report is to provide historical and technical information to guide current management activities and to raise issues which need to be considered in the General Management Plan for the site. The recommendations contained in this section of the report are divided into three categories: the immediate preservation/stabilization needs of the landscape, the annual maintenance schedule once the initial work is accomplished, and the major issues relative to the landscape which are of long-range management concern. The recommendations which follow are based on the present understanding of site history and conditions and on currently recommended horticultural practices. These recommendations should be assessed and revised as new information becomes available.

The preservation/stabilization schedule on the following pages outlines work which needs to be done on a one-time basis to preserve plant material which is currently part of the landscape. Landscape dynamics are such that some plants which are a vital part of the grounds today may not survive another year growing under existing conditions. A planting bed in the office entry courtyard, for example, was half filled with pachysandra at the beginning of the summer but is now all goutweed. Dead limbs on many of the older trees are not only unsightly; they will become a safety hazard if not attended to.

The annual maintenance schedule is based on the assumption that the initial preservation/stabilization work has been accomplished and that the grounds have been brought to an operational level. This is a preliminary schedule and checklist for the gardener which will be revised and added to as the Park Service gains more experience in operating the site.

Decisions on long range plans for the grounds have not yet been made. A number of issues were raised during the course of this study which will need to be considered in the preparation of the General Management Plan. These issues are discussed in the final pages of this section.

A. PRESERVATION/STABILIZATION NEEDS

The following schedule outlines the preservation/stabilization measures which should be carried out immediately to prevent further regression of the plant material and design principles within each area. This preservation work should be carried out over the course of a growing season. Where activities require a specific time of year, that time has been noted. Since constant judgements will have to be made during the course of the work, it is important that the person

directing the project have a thorough understanding of Olmsted's work and of horticulture. The schedule is only an outline for the work to be accomplished, the historical and horticultural information contained elsewhere in this report will be an important resource to be consulted frequently during the course of the project as will the extensive collection of plans and photographs on file at the site. The hours listed below are only rough estimates of what will be required to accomplish each task.

1. Hollow	Hours
Eliminate tree seedlings (including those beneath the hemlocks and the buckthorns at the top of the stairs).	20
Eliminate weeds above puddingstone ledge.	8
Eliminate goutweed.	16
Prune woodbine where it is growing out of place.	6
Thin and prune euonymus on ledge.	12
Augment soil with mulch, compost and/or manure (consider application of inorganic fertilizer).	16
Lime where needed (not rhododendrons and azaleas).	4
Prune back and/or thin rhodendrons and azaleas (some already complete) (before July 15th).	8
Prune yews (already thinned) and other trees and shrubs (before July 15th).	8
Encourage present groundcovers, divide and replant as needed.	16
Encourage bergenia along steps and upper path.	16
Divide and replant perennials as necessary.	12
Restone pathway.	6
Weed (season).	40
Spray for pest and disease as needed.	8
Water (season).	30
Dead-head and maintain plants throughout season.	32
Miscellaneous.	20
Total	278

2. Path to Office	
Fix drains from roof to eliminate soil contamination (by carpenters and roof contractor).	--
Eliminate goutweed and other weeds.	20
Supplement beds with organic materials and fertilize.	8
Lime all beds.	1
Prune summersweet (early spring).	2
Reestablish groundcovers.	12
Divide and replant hosta.	4
Weed.	20
Water.	8
Maintain beds through season.	15
Miscellaneous.	10
Total	100

3. Driveway and beds at front of house

	Hours
Prune back shrubs for rejuvenation (early spring).	20
Eliminate buckthorn in center circle.	4
Eliminate goutweed in circle and house beds and weeds at entrance.	24
Prune dead limbs from trees.	8
Thin lower branches of hemlock.	6
Supplement all beds with organic materials.	12
Lime and fertilize all areas (except azaleas and rhododendrons).	6
Trim shrubs to shape throughout season.	22
Encourage all shrubs (water, pruning, fertilizer).	16
Consider moving those not receiving enough sun (i.e. barberries, bridle wreath, etc.).	--
Reestablish groundcovers, once goutweed is removed.	28
Eliminate weeds in gravel, add gravel where necessary.	20
Reset stones at north edge of driveway for safety.	4
Weed.	30
Maintain beds throughout season.	18
Water.	8
Miscellaneous.	20
Total	246

4. Rock Garden

Eliminate tree seedlings.	24
Prune mountain laurel (carefully) for shape and encouragement of new growth.	16
Supplement beds with organic materials and fertilizer (no lime).	24
Prune shrubs for shape.	20
Encourage vinca along path, add new plant material if necessary.	24
Weed.	30
Maintain beds throughout season.	20
Water.	10
Miscellaneous.	20
Total	188

5. South and West Lawn

Thin tree seedlings at border.	24
Eliminate dead or severely diseased plant material throughout area.	16
Rejuvenate shrubs and trees.	40
Lime, fertilize and add organic materials to all areas.	16
Divide and replant overgrown fern beds.	18
Eliminate goutweed, where not desired.	28
Eliminate blackberry and raspberry patches, and other weedy material in shrub border (some brambles may be left along fence above shed).	24

	Hours
Divide and replant daylily beds.	16
Eliminate or control goutweed along steps south of shed.	24
Repair fence at parking lot. (carpenters)	--
Rejuvenate lilac near steps.	6
Spray for disease and pest problems where they appear threatening.	16
Weed.	60
Water.	18
Maintain lawn and borders (mow and rake).	160
Miscellaneous.	80
Total	546

6. Parking Lot

Eliminate tree seedlings.	24
Prune back lilac and quince.	12
Control grapevines at fence.	24
Prune shrubs to encourage regrowth.	16
Eliminate weeds (major weed problems).	32
Eliminate grass in gravel and add new gravel as needed.	16
Lime and supplement all beds.	6
Divide and replant lilies at entrance	8
Encourage plants at vault wall. Thin and prune as necessary.	16
Weed.	25
Water.	8
Maintain throughout season.	15
Miscellaneous.	10
Total	212

7. Office Entry Courtyard

Eliminate goutweed and other weeds.	24
Lime and supplement beds.	6
Divide and replant perennials.	8
Prune climbing hydrangea as needed.	6
Weed.	16
Maintain throughout season.	10
Water.	4
Miscellaneous.	10
Total	84

8. Service Courtyard

Eliminate weeds and grass in gravel.	6
Prune back yews.	4
Maintain cypresses.	2
Miscellaneous.	2
Total	14
Total Hours	1,668

As a rough estimate, the above plan would require two full-time employees for 6 months. (April to September).

B. ANNUAL MAINTENANCE

This schedule describes the gardeners duties on a month by month basis. Yearly and cyclic activities have been included in the same schedule with notations indicating the period of cyclic activity. The schedule includes all horticultural and grounds maintenance activities but does not include other duties normally assigned to the gardener such as setting out the trash each week or administrative activities such as record keeping, training, sick and annual leave time.

The gardener should maintain a brief daily log of activities performed, the time required to do them and any problems encountered so that this schedule can be revised and added to from year to year. In addition to the schedule, the historical and horticultural information contained in this report should serve as an important guide for the gardeners day-to-day activities. The appendices contain additional information including a bibliography and a list of horticultural information sources. A separate notebook has been prepared for the gardener which contains more detailed information on soil test results, product information and general maintenance practices. Books are also available in the park library on horticultural problems and practices.

January: no work

February: no work

March: (2 weeks work only)	Hours
1. Request spray schedule for grapes & roses from Suburban Experiment Station. Check on approved pesticides for current year. Order lime and fertilizer needed for April.	1
2. Check for scale, cottony aphid and aphid eggs. Purchase dormant oil spray if needed.	2
3. Review site for pruning needs, disease and dead limbs.	4
4. Prune yews, evergreen trees, non-flowering shrubs and deciduous trees (except birch, dogwood, elms, maple and yellowwood) for shaping and thinning as needed. Thin quince, lilacs, mock-orange, deutzia, etc. as needed - be aware that too much pruning at this time will limit flower production. (Further pruning can be done after flowering.)	20
5. Remove any dead trees or shrubs. Replace as appropriate.	12
6. Remove weak or trailing shoots of euonymus, hydrangea and other vines as needed.	16
7. Arrange for pruning of elm and pruning of any tree limbs too large to be handled by park service personnel.	2
8. Spray infected plants with dormant oil for control of scale, cottony aphid and other unwanted egg masses if necessary.	4
9. Prune summersweet to increase summer flower production.	2
10. Dress grape beds with compost or manure when frost is out of ground.	4
11. Remove mulch from perennials and roses (last week, weather permitting). Remove dead leaves from plants.	8
12. Miscellaneous.	5
Total	80

		Hours
April:		
1.	Clean up grounds from winter damage.	8
2.	Prune roses and fertilize.	8
3.	Dress mountain laurel and pieris beds with peat, compost or manure.	5
4.	As leaf growth begins, spray grapes & roses with fungicide for black spot according to spray schedule.	4
5.	Divide and replant crowns of hosta as growth begins.	16
6.	Fertilize and spread weed and crabgrass control on lawn.	8
7.	Reseed lawn where necessary.	6
8.	Fertilize and lime trees and shrubs every 2-3 years or as needed (almost every year at first). Fertilize broad-leaf evergreens with one-half annual fertilizer (use organic fertilizer if possible on broadleaf evergreens, i.e. castor pumace, soybean meal, cottonseed meal).	16
9.	Fertilize and lime herbaceous plants and groundcovers.	18
10.	Spray elm with dormant spring application of malathion/ methoxychlor. (contractor)	4
11.	Take cuttings of trees and shrubs on new growth for propagation purposes.	4
12.	Order annuals and groundcovers or other plant material to be planted in May.	2
13.	Prepare garden beds. Plant cool crops to be grown (i.e. cabbage, cauliflower, peas, onions, broccoli, brussel sprouts).	12
14.	Dead-head tulips and other bulbs after flowering - leave flower stalk.	18
15.	Order and apply gravel and stone to paths and driveways as needed.	16
16.	Miscellaneous.	10
	Total	155

May:		
1.	Cut and rake lawn 2 times.	16
2.	Pick up litter and debris.	8
3.	Rake paths.	4
4.	Dead-head spent flowers and weed.	30
5.	Take cuttings of necessary plant material not propagated in April.	6
6.	Plant annuals.	8
7.	Set out new trees (if needed) and mulch as necessary.	6
8.	Plant groundcovers and perennials where needed, replace lost species.	16
9.	Spray roses and grapes. Check for pest & disease problems on other plants.	4
10.	Plant vegetable garden.	6
11.	Prune lilacs after blooming.	6
12.	Order bulbs for fall.	1
13.	After May 15th sprays effective for gypsy moth populations. Spray heavily infested areas if necessary.	4
14.	Check elm weekly for signs of Dutch elm disease. Call arborist immediately if signs develop.	2
15.	Water new plantings. (morning hours)	8
16.	Miscellaneous.	12
	Total	137

		Hours
June:		
1.	Cut and rake lawn 4 times.	32
2.	Pick up litter and debris.	8
3.	Rake paths.	4
4.	Weed and dead-head spent flowers.	30
5.	Prune rhododendrons, azaleas and other flowering shrubs when gone by. Dead-head remaining portions of shrubs.	16
6.	Apply second half of fertilizer application to broad leaf evergreens.	4
7.	Prune birch, dogwood, maple, yellowwood and other heavy bleeders as necessary.	8
8.	Spray for crawling stage of scale and cottony aphids as needed.	2
9.	Apply herbicide for weed control in severe areas and along paths.	6
10.	Spray grapes and roses.	2
11.	Watering. (morning hours if possible)	10
12.	Check elm weekly for signs of Dutch elm disease, call arborist immediately if signs develop.	1
13.	Check weekly for other pests or disease.	4
14.	Miscellaneous.	14
	Total	141
July:		
1.	Cut and rake lawn 4 times.	32
2.	Pick up litter and debris.	8
3.	Rake paths.	4
4.	Weeding.	30
5.	Maintain herbaceous beds.	6
6.	Check elm weekly for drooping leaves or yellowing foliage. Call arborist immediately if these conditions develop. Be sure elm is sprayed with its summer application.	1
7.	Prune arborvitae, yews, cypresses.	16
8.	Control Japanese beetles (hand pick, spray only if severe).	4
9.	Prune vines (wisteria, actonidia, etc.) for control.	8
10.	Prune remainder of flowering shrubs after bloom.	6
11.	Remove suckers and water shoots on trees and shrubs.	2
12.	Check for development of fungal disease on hawthorns; check all trees and shrubs for pest and disease. Treat accordingly.	4
13.	Dead-head goutweed.	8
14.	Watering. (morning hours)	8
15.	Miscellaneous.	10
	Total	147
August:		
1.	Cut and rake lawn 4 times.	32
2.	Pick up litter and debris.	8
3.	Rake paths.	4
4.	Weeding.	40
5.	Trim boxwood and take cuttings.	6
6.	Maintain herbaceous beds.	4

		Hours
7.	Dead-head goutweed.	4
8.	Pull out maple and other tree seedlings.	16
9.	Check grapes for powdery mildew. Harvest late August - September.	1
10.	Watering.	8
11.	Weekly - check elm, check for Japanese beetles and other pests.	4
12.	Miscellaneous.	15
	Total	142

September:

1.	Fertilize lawn (September 1st).	4
2.	Pick up litter and debris.	4
3.	Cut and mow lawn 2 times.	16
4.	Plant bulbs.	8
5.	Divide and plant perennials.	16
6.	Prune grapes (preferably before leaf fall).	16
7.	Rake and destroy prunning clippings.	4
8.	Weeding.	20
9.	Rake leaves, grind for mulch-spread.	24
10.	Watering.	4
11.	Miscellaneous.	8
	Total	124

October:

1.	Cut and rake lawn 1 time.	8
2.	Pick up litter and debris.	4
3.	Grind and spread leaves as mulch.	6
4.	Rake paths.	4
5.	Rake leaves.	32
6.	Clean out dead material in beds.	16
7.	Gather quince fruits, store cool and dry.	2
8.	Mulch, compost and/or manure shrub beds for spring.	16
9.	Miscellaneous.	8
	Total	96

November:

1.	Order lime and apply to lawn.	4
2.	Pick up litter and debris.	4
3.	Rake paths.	4
4.	Rake leaves.	20
5.	Mulch roses and perennials for winter protection.	8
6.	Keep grounds clean.	4
7.	Miscellaneous.	8
8.	Sharpen and care for pruning and gardening equipment; order necessary materials for spring.	8
9.	Check and repair fencing as needed.	8
10.	Miscellaneous.	4
	Total	72
	Total for Year	1,094

C. LONG TERM PLANNING ISSUES

1. Preservation, Restoration, Reconstruction

> It is better to preserve than to repair, better to repair than to restore, better to restore than to reconstruct.

This National Trust adage has become the country's preservation slogan when considering the built environment. This slogan is just as appropriate when dealing with historic landscapes. However, there are fewer examples of landscape preservation, restoration and reconstruction so it is important to clarify what these terms mean when applied to the landscape.

Reconstruction of a building or a landscape implies putting back pieces that might have been part of the design. The term implies there is room for interpretive liberties and educated guesswork. Current preservation philosophies discourage this approach, however, since later additions are often removed and replaced with what might have been. The lack of evidence regarding the landscape design executed by FLO Sr., for instance, would require that his landscape be 'reconstructed'. This is not advisable since later elements of the landscape and buildings would have to be removed. Landscape reconstruction is valuable when one is designing a period landscape for an historic building where little documentation regarding the original landscape design remains, and where modifications which have occurred since the primary historic period are considered of little importance. The atmosphere of the designed grounds would be compatible with the historic structure(s), but the landscape would not be 'authentic'.

Restoration generally refers to taking a building or landscape back to a particular period when it was associated with a famous person or event. Later alterations or additions to the design are removed and missing pieces are duplicated according to the original plans. Restoration does not imply interpreting what used to be there nor does it allow for educated guesswork. Restoring a building or similar structure is not difficult if all the data is available. The same is true for the landscape except that the size of the plant material will constantly be changing and therefore the appearance will be altered as the seasons and years progress.

To preserve is to maintain as one found it, in the best condition possible. Generally when a preservationist comes on the scene the site has past the point of needing only status quo maintenance. This means that stabilization and corrective maintenance repairs may have to be done to preserve the site in its best condition. Little is done to return the site to a previous period or design. The recommendations contained in the preservation/stabilization schedule and the annual maintenance schedule are based on the assumption that this approach should be followed at Fairsted, at least as an intermediate step until the General Management Plan is approved. Preservation allows for more flexibility than restoration. Preservation of a site can occur on many levels: from strict adherence to historical evidence to adaptive reuse under preservation guidelines. Preservation allows for the interpretation of many historic periods within a plan.

Adaptive reuse may become necessary when modern needs exceed the importance of the historic purpose. The term and its activities are controversial and divide the pure preservationists from those who are more compromising. Adaptive reuse can be applied to the historic landscape when parking facilities become necessary on a site or when crowd control measures and foot paths become necessary additions to the historic landscape. In the interest of public safety, portions of the landscape may have to be altered to minimize overall impact on the site. Those areas at Fairsted which maintain the highest level of historic integrity such as the hollow, rock garden and south lawn may prove to be the most valuable to protect. Those areas with less integrity such as the parking lot and service courtyard may become subject to sacrifice. Changes in the historic landscape should be considered as a last resort, when other alternatives have been exhausted.

Preservation philosophy will vary with each site and situation. Landscapes may fall most easily within the preservation category, with some adaptive reuse necessary when problems arise. Restoration may be possible in those cases where exact plans and plant material exist. Reconstruction of a period landscape may enhance an historic structure more than a modern landscape design. In each case, the public should be aware of the approach which was employed. Honest interpretation of the landscape is as important as honest interpretation of the structures.

2. Time Period

The time period to be represented in the Fairsted landscape should be compatible with that represented by the structures on the property. It is clear that there are certain dates or eras in the history of the Olmsted site which are important either because of the events which occurred at that time or because of the amount of information available. The following outline lists those times which were particularly important in the landscape history and briefly summarizes the status of the landscape design and the amount of information available.

1883 - Olmsted Sr. purchased the site which was primarily orchard at the time. Very little information exists for what he did to redesign the landscape. Further information would be worth pursuing, especially for interpretive purposes.

1895 - Olmsted Sr. retired. His original designs were mature by then. This period more than any other reflects his design influence as opposed to that of his sons. Aside from a few photographs, very little information is available.

1903 - Olmsted Sr. died and the site was completely surveyed for legal purposes. No complete inventory of plant material was taken, but the survey plan and some accompanying photographs indicate the overall design of the site. The firm name was changed to Olmsted Brothers at this time.

1910 - At this time Hans Koehler, horticulturist for the Olmsted Brothers took extensive field notes on a copy of a 1904 plan, indicating plant locations and suggestions for the replacement or addition of new plant material. Plant order sheets and a few correspondence letters document those changes which actually occurred. A few photographs exist.

1920-1930's - A large portion of the grounds was extensively redone during this period such as the hollow, rock garden and office entry courtyard. Just after 1926 the annual garden was changed to a parking lot. In 1935 Frederick Jr. left for California and the tenant period began. Many plans, photographs, order sheets and planting notes document these changes. Much of the plant material remains in place today.

1949 - Frederick Jr. retires marking the end of direct Olmsted family influences on the site. Very few photographs and no plans are available which illustrate the grounds at this time.

1961 - The firm name was changed to Olmsted Associates. A year later one of the firm's principal members retired and Joseph Hudak and Artemas Richardson remained as co-partners. They added new plants to the hollow, front driveway and south lawn. No plans and few photographs are available.

1968 - The swimming pool, terrace and herb/vegetable garden were added to the south of the house. Some photographs and construction plans exist.

1979 - Legislation was passed authorizing the National Park Service to purchase the site.

1981 - The site was officially opened to visitors under the supervision of the National Park Service. Extensive photographs were taken and plans of the existing landscape and its condition were drawn.

Since there is relatively little evidence pertaining to the details of the landscape design in Olmsted Sr.'s time and since substantial changes (which are also of historical interest) have occurred since his death, it seems inappropriate to restore the landscape to his time. We have ample documentation for most areas of the grounds when they were redone in the 1920's and 30's under the firm 'Olmsted Brothers'. If this time period were

chosen, there is a substantial amount of plant material which would have to be restored to the grounds. The question, however, remains: is one time period more important than another?

Instead of restoring the landscape to a particular time period, it could be interpreted as a continuum from 1884-1979. This 'preservation' approach would preserve landscape elements essentially as they were when the Park Service acquired the property. This method would allow for interpretation of the grounds in the various periods, attributing any changes to the proper Olmsted or firm member. The entire history would be portrayed as a constant evolutionary process. No plant material would be removed and future upkeep would require replacing failing plants and maintaining the grounds in good condition.

A 'limited restoration' approach would allow for removal of major elements added in the past twenty years such as the swimming pool and terrace. Many people familiar with the earlier work of the firm find these recent changes inconsistent with the design principles and general character of the site. In addition, this method might allow for restoring some lost elements to the grounds such as the archway over the Warren Street entrance. This archway existed from 1883-4 to the late 1950's. If rebuilt, it would convey more of the character of the property as the Olmsted family knew it. Areas of the grounds which have sustained considerable deterioration, such as the plantings about the parking lot and those in the office courtyard, might also be suitably restored. The justification for most of the changes under this approach however, is based on aesthetics. Aesthetic values may change over time, i.e. in 50 years the swimming pool may be an element which future generations consider significant. The limited restoration approach would appear to be more valuable for presenting the true historic character of the site. However the strict preservation approach (maintaining the landscape essentially as it is) has sound footing in that nothing is being destroyed or replaced.

3. Maintenance of the Naturalistic Landscape

It is difficult to make a design appear as if it would have been formed by nature, especially when one labors hours over a drafting table imitating the effect. What Olmsted tried to achieve in his designs - the atmosphere of nature enhanced - shows his true genius, both in his use of plant material and in his aesthetics. By incorporating introduced and native varieties and arranging the plants in a manner reminiscent of that which may be found on a much larger scale in natural scenery, he led visitors along paths which they believed had always been there. The hand which created the design was never apparent. This 'artificial nature' was so carefully planned that few stopped to study the true genius of the design. This designed, naturalistic landscape cannot be left on its own without interference as can the natural scenery.

The terms 'overgrown' and 'naturalistic' are two very distinct states of being. 'Overgrown' implies neglect. Something which has achieved a state of being overgrown can be fantastically beautiful, such as brambles running along a stone wall, but it is generally not a state which was intended, i.e. the farmer would have not allowed his fields to contain large bramble patches. 'Naturalistic' implies 'as in nature'. When an ecosystem is in balance, each plant checks the other and no 'overgrowth' exists. Only when something, such as man, disturbs the equilibrium of the ecosystem does overgrowth have the potential for entering the scene. Therefore, overgrowth is a major problem in preserving any designed landscape, especially one which has been neglected.

A formal landscape (i.e. boxwood parterres, knot gardens, mazes, etc.) is sometimes easier to maintain than a naturalistic one. Formal gardens need constant attention, but the attention here is easy to recognize - as soon as one plant begins to fade or one plant begins to overstep its bounds, it is immediately recognized and tended. The naturalistic garden is deceptive. If a few plants become overgrown, they are not as easily recognized. After a few years, they are found to have grown out of scale with the surroundings. Drastic recovery measures (i.e. pruning, replacement etc.), in either type of design are extremely obvious.

It remains for a sensitive and skilled gardener, to rejuvenate and maintain the neglected landscape. There are many interpretations possible within the Fairsted design; design guide lines are not as cut and dried as they are in formal gardens. Pruning the azaleas and rhododendrons in the hollow, for example, will require more skill and care than trimming the boxwood parterres at Longfellow House. The intended design principles at Fairsted must be respected; naturalistic effects must replace the overgrown. Olmsted's writings which concern the annual care and upkeep of his parks may be applied to his home grounds; refer to the books "Forty Years of Landscape Architecture: Central Park (by Theodora S. Kimball), Reports to the Boston Metropolitan District Commission, etc. for further information.

Careful study and planning must precede complete rejuvenation efforts, but stabilization to prevent further decline in plant material must accompany the research and planning stages. There are few examples to follow and printed resource material is scarce. Nevertheless, the dynamic nature of the landscape, whether the design be formal or naturalistic, requires that rejuvenation and maintenance efforts be enforced.

4. Impact of Plants on Structures

The actonidia and wisteria climbing over the east and south facades of the house have been the subject of increasing concern. These vines, in clinging to the house, have wound themselves through shutters, around gutters and under eaves. The moisture held about the plants has resulted in deterioration of the clapboards underneath. The ivy, woodbine and climbing hydrangea on the brick walls of the vault have caused similar problems. Olmsted used vines extensively in his designs, as they masked the angularity of structures and created a transition element between the

buildings and the surrounding vegetation. It is desirable from a landscape design viewpoint to permit the vines to remain. Once the structures have been restored and freshly painted, however, these vines will have to be controlled if they are to continue growing on the buildings. Precautions must be taken to alleviate further problems.

First and foremost, the vines must be pruned continuously to keep them within bounds. They should not be allowed to wander at will over the walls. Secondly, a trellis should be designed for the vines to climb on which will keep the vines from direct contact with the structures. Wooden trellises or wire screens can be installed an inch or two from the wall and painted the same color as the house. The trellis will blend with the house and still prove functional. Should these trellises be undesirable, the vines must be pruned severely every few years to allow the structures to be repaired and to dry out.

5. Impact of Visitors on the Landscape

The amount of foot traffic which the site currently receives is without historical precedent. Visitors should be encouraged to use pathways where they exist. Should the grass begin to show wear along the south lawn, protective measures may be necessary. Wooden planking, such as that which followed the northern end of the driveway during Olmsted's time may become necessary for the south lawn. These could be laid out during periods of heavy visitation and changed or removed when foot traffic is light. Alternate paths defined by low fencing could also be considered. They could be changed to reroute traffic to another section of the lawn to minimize wear. Should the original pathway be reinstalled where the terrace and herb garden are now, visitors could be encouraged to remain on this pathway. Ideally, visitors should be allowed to wander the south lawn at will, examining plant material and overall design effects. This may not be possible if visitor numbers increase dramatically.

The beds in the hollow and rock garden, by their design, do not encourage crossing their borders. If it appears visitors are walking through plant beds, either as a shortcut or to examine plant tags, a form of low fencing may be required. This fencing should be in keeping with the picturesque qualities of the property. The landscape should be protected from foot traffic with a minimum of controls. To date, few problems have been encountered.

6. Fire Protection

The density of most plant material on the property is fairly light. When properly maintained, dead leaves and dry plant material should not be a problem in those areas closest to structures. The west embankment and south border of the lawn along the stone wall support woodland vegetation. Plant density in these areas is higher than for the rest of the property and some dead leaves and twigs are allowed to remain although dead trees and major dead branches have been removed. The potential for fire is the greatest in these more heavily wooded areas but is not a serious concern at present.

The structures are equipped with fire extinguishers in key locations and a comprehensive fire and smoke detection system will be installed in the buildings in 1982. Fire department response time in all parts of Brookline is good. A fire alarm pull-box is located on a telephone pole just north of the Warren Street entrance to the property and there are several hydrants in the immediate vicinity.

7. Authenticity of Maintenance Practices

Pest and disease problems can plague historic plant material. Controls for these problems are varied and the value of historically authentic controls will depend on the purpose of the site. Often, old types of controls were not as effective as modern sprays. Fruit production and overall plant appearance were not as pleasing as seen in todays plants. Should complete authenticity be desired, then historic controls could be employed, even though they may not be effective on new resistant strains of pests and diseases which call for modern methods of control. Tradeoffs have to be considered as these newer controls may also be necessary to ensure longevity of the historic plant material. For example, Dutch elm disease was not a threat during Olmsted Sr.'s time, therefore there are no historical controls. The use of modern pesticides is warranted because of the importance of the elm in the overall landscape design.

There is little record of what controls were used on the site by the Olmsteds. In 1910 Hans Koehler notes using a nicotine spray for juniper webworm in the hollow. This spray was used extensively as a pest control, as was the practice of laying tobacco leaves amongst plants. Nicotine spray is considered hazardous to the health of the applicator by today's standards. Substitute pest and disease controls include soap and water sprays, flour dust, hand picking, companion plantings and other organic controls.

Manure and mulch were applied to the grounds continuously until the 1940's when the first record of inorganic fertilizer applications appear. Manure and mulch applications may be continued if the labor for spreading it is available and the odor is not considered offensive. Given the current poor condition of the soil, it may take a few years longer for the mulch and manure to break down and be effective. Inorganic fertilizer has the advantage of being easy to handle and contains more readily available nutrients than the organic alternatives. This method therefore may produce quicker results. Plants require specific amounts of micro- and macro-nutrients for good growth. It makes no difference where the plant gets those nutrients.

The authenticity of maintenance tools i.e. lawn mower, rakes, shovels, spray applicators, etc. will depend on the final management philosophy. Should the grounds work be completed before visitors arrive, the authenticity of maintenance practices will be of minimal concern.

8. Additional Research Potential

Each time new material is discovered, the factual information available for interpreting the Olmsted estate will grow. During the study period, a glass plate negative of the south lawn was discovered misfiled under another project number. In the center of the lawn, east of the Olmsted elm, a young woman stood beneath a gigantic pruning pole. Other glass plates in the same file show John Charles Olmsted, in a seat attachment, scaling the pole. Until this time there had been no record of the methods used for large scale tree pruning anywhere on the property. Incidents such as this may reveal further information about Fairsted that are, as yet, unknown.

A systematic review of the Frederick Law Olmsted papers* and those of his son, Frederick Jr. at the Library of Congress, as well as the letters of John Charles and his wife, Sophia, at the Harvard Graduate School of Design will undoubtedly reveal further information. These letters make reference to incidents or plantings at Fairsted of which we currently know very little, especially during the early years on the estate. There was not time in the course of this study to undertake thorough research of these collections.

A third potential for research exists in designing a plant inventory and labelling plan for grounds. Temporary wooden labels have been applied to most plants on the property, but permanent labels will be necessary in the near future if this system is to be retained. Permanent labels might include such information as botanical name, common name, date planted (if available), source (if available) and whether the species is native or introduced. A coordinating card file and mapping system could be designed which would record any pruning, fertilizing, spraying or plant replacement done on the property. Consultation with the staff at the Arnold Arboretum may aid in designing such a system.

A gardener's record of work done or changes made on the property such as was kept during the course of this study, would indeed be valuable for future reference. Photographic documentation in color and black and white should also be done periodically.

9. Interpretation

Interpretation at many historic sites has been limited to interior tours and exhibits, with little attention given to the landscape. Fairsted offers a unique opportunity to fully integrate the landscape into the interpretive program since it embodies the basic purpose of the site. There is an infinite variety of themes and subthemes to be considered in the formation of an interpretive program pertaining not only to Fairsted but to Olmstedian designs throughout the surrounding community and across the nation. For example, the following themes should be considered:

Omsted's design and planning principles as exemplified at Fairsted.
The history and evolution of the Fairsted landscape.

*Work on the papers of Frederick Law Olmsted Sr. has already begun under the direction of Charles McLaughlin and Charles Beveridge.

Olmsted's selection of plant materials in landscape design (color without a flower garden).
Fairsted's landscape through the seasons.
The Olmsted family and their use of the grounds.
Preservation and rejuvenation of an historic landscape.
Plant identification and ecological principles.

There is a wide selection of media which can be used effectively for interpretive purposes. The suitability of each medium is outlined below:

a. Guided Tours

This medium is obviously desirable when weather and staffing permit. It allows the visitor to view the grounds with an experienced guide who can relate the history of the site and point out features of particular interest including seasonal events such as plants in bloom. Since the visitors will have a varied knowledge of horticulture and landscape architecture, it is important that guides be well informed and able to answer questions.

b. Slide Programs and Lecture Topics

This medium has the advantage that it can be used off-site as well as on-site in inclement weather. Slides are a good way to make comparisons and show the evolution of the landscape over time and through the seasons. An extensive selection of slides was taken throughout the study period illustrating the flowering and fruiting cycles of most plant species at Fairsted, Olmsted's design principles, and any grounds rejuvenation activities undertaken at the site. In addition, over 100 slides of archival plans and photographs are available which depict the landscape as it changed over time. Slides are also readily available which illustrate other Olmsted projects in Boston and New York. Combinations of old and new photographs should yield exciting material for a wide variety of topics, providing a valuable educational resource.

c. Publications

One way of bridging the gap between a major planning document such as this and the general public is to produce a small brochure which will acquaint visitors with the highlights of the history and significance of the Fairsted landscape. Since the staff is small and cannot always take time to fully answer questions about the landscape, a brochure would be valuable in providing basic information. It might include a plan of the site, some areas and plants to look for and possibly one or more historic photographs. Other more detailed publications, including articles in various history or horticulture related publications, may be of interest to the professional community. The preservation of the landscape is an unusual effort which should be well documented and publicized.

d. Exhibits

The large amount of exhibit space available in the visitor reception area offers ample room for exhibits pertaining to the landscape and the house. The possibility for exhibit material is enormous. Matted photographs, recent and period, as well as copies of major landscape plans could illustrate Olmsted's work on and off the site. The materials generated by his sons and successors increase thematic possibilities tenfold. Whether used strictly on site or as part of a travelling exhibit this medium can prove invaluable for interpretive and illustrative purposes.

FOOTNOTES

1. Charles E. Beveridge, "Frederick Law Olmsted's Theory on Landscape Design," Nineteenth Century, p. 38.

2. FLO to Mariana Griswold Van Rensselaer, Frederick Law Olmsted Papers (FLOP), Library of Congress, Washington, D.C.

3. Beveridge, op. cit. , p. 40.

4. FLO, Walks and Talks of an American Farmer in England, (New York, 1852) II:155; quoted in Beveridge, op. cit., p. 40.

5. Beveridge, op. cit., p. 41.

6. Draft of "Address to Civil Engineers," FLOP; quoted in Beveridge, op. cit., p. 42.

7. Beveridge, op. cit., p. 42.

8. Alexander Pope, "An Epistle to Lord Burlington"; cited in Beveridge, op. cit., p. 38.

9. Manuscript fragment, FLOP; quoted in Beveridge, op. cit., p. 41.

10. Interview with Joseph Hudak, Frederick Law Olmsted National Historic Site (FLONHS), July 15, 1981.

11. John Charles Olmsted (JCO) to Sophia Olmsted, letter dated January 5, 1899, Box 1, JCO Collection, Frances Loeb Library (FLL), Harvard University.

12. Draft of Historic Resource Study for FLONHS, June, 1981, p. 5.

13. Arthur A. Shurcliff, "Frederick Law Olmsted," Recollections of Arthur A. Shurcliff, 1952, p. 1, Archives, FLONHS.

14. Draft of Historic Resource Study for FLONHS, June, 1981, p. 6.

15. Ibid, p. 7.

16. JCO to Sophia Olmsted, letter dated June 4, 1899, Box 1, JCO Collection, FLL, Harvard University.

17. Plan #673-1H, plan #673-20, Archives, FLONHS.

18. Plan #673-20, Archives, FLONHS.

19. JCO Personal Photograph Albums (#1 and #2), JCO Collection, FLL, Harvard University.

20. Plan #673-20, Archives, FLONHS.

21. JCO Personal Photograph Albums, FLL, Harvard University.

22. FLO Sr. to JCO, letter dated September 12, 1884, FLOP; cited in Beveridge, op. cit., p. 39.

23. Waverly Keeling, "Home of Frederick Law Olmsted, Landscape Artist of the World's Fair," article in the Chicago Inter-Ocean, 1896, newspaper clipping, Vertical File, FLL, Harvard University.

24. Hazel G. Collins, "Landscape Gardening in Brookline," Section 4, 1903, Archives, FLONHS.

25. Plan #673-8; Planting Lists to accompany Plan #8 dated Fall, 1910, January, 1912, Planting File #673, Archives, FLONHS.

26. Memo, Planting File #673, Archives, FLONHS.

27. Plan #673-24, plan #673-1 (updated, 1929), Archives, FLONHS.

28. FLO Jr. to JCO, letter dated June 20, 1917, Box 4, File 20, Olmsted Associates Papers, Archives, FLONHS.

29. Letters dated 1929-1930, Box 64, File 673, Olmsted Associated Papers, Archives, FLONHS.

30. Plan #673-33, Archives, FLONHS.

31. Plan #673-37, plan #673-38, plan #673-39, Archives, FLONHS.

32. Plan #673-48, Archives, FLONHS.

33. Plan #673-40, plan #673-43, plan #673-47, Archives, FLONHS.

34. Plan #673-45, Archives, FLONHS.

35. Records of cost estimates, Planting File #673, Archives, FLONHS.

36. Letter dated September 25, 1952, Office File #673, 1940-61, Archives, FLONHS.

37. Plan #673-56, Archives, FLONHS.

38. Hudak Interview, op. cit.

39. Letter dated June 7, 1961, Office File #673, 1940-61, Archives, FLONHS.

40. Ibid.

41. Hudak Interview, op. cit.

42. Ibid.

43. Ibid.

44. Ibid; Town of Brookline Building Permit Records, 1968; Snapshots in envelope, Rear of Album #2, File #673, Archives, FLONHS.

45. Hudak Interview, op. cit.

46. Hudak Interview, op. cit.

47. Ibid.

48. Ibid; Photographs #673-168, #673-169, #673-171, #673-172, Album #2, File #673, Archives, FLONHS.

49. Plan #673-1H, Archives, FLONHS.

50. Plan #673-20, Albums #1 and #2, File #673, Archives, FLONHS; Photographs in JCO Collection, FLL, Harvard University.

51. Plan #673-1, Archives, FLONHS.

52. Photographs #36, 37, Album #1, Photographs #98A, 110, 191, Album #2, JCO Collection, FLL, Harvard University.

53. Photographs #673-33, 673-99, Album #1, File #673, Archives, FLONHS; Photograph #37, Album #1, JCO Collection, FLL, Harvard University.

54. Photographs #24, 36, Album #1, JCO Collection, FLL, Harvard University.

55. Plan #673-1, Archives, FLONHS.

56. Memo from Hans Koehler dated January 4, 1911, Planting File #673, Archives, FLONHS.

57. Photographs #673-2, 673-7, 673-33, 673-99, Album #1, Archives, FLONHS; Photograph #2919-48, Archives, FLONHS; Photographs 194, 195, 196, 197, 198, Album #2, JCO Collection, FLL, Harvard University.

58. Plan #673-1, plan #673-3, Planting Lists dated April 30, 1904 and May, 1904, Planting File #673, Archives, FLONHS.

59. Photographs #673-66, 673-67, Album #2, File #673, Archives, FLONHS.

60. FLO Jr. to JCO, letter dated January 4, 1911, Planting File #673, Archives, FLONHS.

61. Plan #673-8, Planting Lists to accompany Plan #8 dated October, 1910, December, 1910, and January, 1912, Planting File #673, Archives, FLONHS.

62. Plan #673-26, Archives, FLONHS.

63. Hans Koehler to FLO Jr., letter dated March 8, 1924, Planting File #673, Archives, FLONHS.

64. FLO Jr. to Hans Koehler, letter dated March 18, 1924, Planting File #673, Archives, FLONHS.

65. Plan #673-33, Planting List dated October 5, 1923, Planting File #673, Archives, FLONHS.

66. Plan #673-37, plan #673-38, plan #673-39, Planting List to accompany Plan #673-39 dated December 16, 1924, Planting File #673, Archives, FLONHS.

67. Photographs #673-114A, 673-115, 673-137, Album #2, Archives, FLONHS.

68. Planting List dated July 24, 1925, and September 23, 1926, Plan #673-42, plan #673-44, Archives, FLONHS.

69. Plan #673-49, plan #673-54, plan #673-56, Planting Lists to accompany same, Planting File #673, Archives, FLONHS.

70. Memo by Hans Koehler, Planting File #673, Archives, FLONHS.

71. Notes by Hans Koehler dated 1934, Planting File #673, Archives, FLONHS.

72. Memo by Hans Koehler, Planting File #673, Archives, FLONHS.

73. Hudak Interview, op. cit.

74. Ibid.

75. Ibid.

76. Plan #673-1H, Archives, FLONHS.

77. Plan #673-17, Archives, FLONHS; Eliot Diaries, March 22, 1884, p. 115, Archives, FLONHS.

78. Photographs #673-1, 673-22, Album #1, Archives, FLONHS; Photographs #4, 38, Album #1, JCO Collection, FLL, Harvard University.

79. Hudak Interview, op. cit.

80. Photograph #673-22, Album #1, Photographs #673-62, 673-64, Album #2, Archives, FLONHS.

81. Photographs #673-22, 673-1, Album #1, Archives, FLONHS.

82. Photographs #4, 38, 105, 106, 107, 108, Albums #1, and 2, JCO Collection, Harvard University.

83. Ibid.

84. Ibid.

85. Ibid; Photograph #673-1, Album #1, Archives, FLONHS.

86. Photograph #673-1, 673-2, Album #1, Archives, FLONHS.

87. Planting List to accompany Plan #673-1, dated 1904, Planting File #673, Archives, FLONHS.

88. Photographs #673-54, 673-55, 673-56, 673-57, Album #2, Archives, FLONHS.

89. Memo from Hans Koehler dated 1935, Planting File #673, Archives, FLONHS.

90. Sketch plan dated 1936, Planting File #673, Archives, FLONHS.

91. Hudak Interview, op. cit.

92. Ibid.

93. Plan #673-17H, Archives, FLONHS.

94. Hudak Interview, op. cit.

95. Ibid.

96. Ibid.

97. Planting Lists dated 1904, 1910, Planting File #673, Archives, FLONHS.

98. Plan #673-1H, Archives, FLONHS.

99. Plan #673-20, Archives, FLONHS.

100. Photographs #105, 106, 107, 108, Album #2, JCO Collection, FLL, Harvard University.

101. Photograph #72, Album #1, JCO Collection, FLL, Harvard University.

102. Plan #673-1, Archives, FLONHS.

103. Ibid.

104. Photographs #673-36, 673-50, 673-51, Album #1, Archives, FLONHS.

105. Plan #673-8, Planting List to accompany Plan #8, Planting File #673, Archives, FLONHS.

106. Plan #673-8, Archives, FLONHS.

107. Plan #673-36, plan #673-48, Archives, FLONHS.

108. Planting List to accompany Plan #673-36, dated August, 1924, Planting File #673, Archives, FLONHS.

109. Photographs #105, 106, 107, 108, Album #2, JCO Collection, FLL, Harvard University.

110. Plan #673-1H, Archives, FLONHS.

111. Photographs #12, 15, 21, 28, Album #1, JCO Collection, FLL, Harvard University; Photograph #673-3, Album #1, Archives, FLONHS.

112. Plan #673-20, Archives, FLONHS; Photographs #25, 35, Album #1, JCO Collection, FLL, Harvard University.

113. Plan #673-20, Archives, FLONHS; Photographs #21, 22, 90, 94, Album #1, JCO Collection, Harvard University.

114. Photograph #2, Album #1, JCO Collection, FLL, Harvard University.

115. Photographs #15, 21, 22, 90, 91, 92, 93, 94, Albums #1 and 2, JCO Collection, FLL, Harvard University.

116. Glass plates added to Photograph Collection #673, Archives, FLONHS.

117. Photographs #12, 15, Album #1, JCO Collection FLL, Harvard University.

118. Photographs #673-9, 673-38, 673-39, 673-47, Album #1, Archives, FLONHS.

119. Photographs #673-51A, 673-123, Album #2, Archives, FLONHS.

120. Photographs #21, 22, 28, Album #1, JCO Collection, FLL, Harvard University.

121. Photographs #12, 21, 28, 22, Album #1, JCO Collection, FLL, Harvard University.

122. Photographs #673-48, 673-36, 673-51A, 673-37, 673-38, 673-39, Album #1, Archives, FLONHS.

123. Photographs #36, 38, 39, Album #1, JCO Collection, FLL, Harvard University.

124. Photographs #673-106, 673-50, 673-25, Albums #1 and 2, Archives, FLONHS; FLO Jr. to JCO, letter dated June 20, 1917, Box 4, File 20, Olmsted Associates Papers, Archives, FLONHS.

125. Photographs #21, 22, 90, 94, 100, Album #1, JCO Collection, FLL, Harvard University.

126. Photographs #97, 99, 117, 118, Album #2, JCO Collection, FLL, Harvard University.

127. Plan #673-1, Archives, FLONHS.

128. Photographs #673-36, 673-38, 673-40, Album #1, Archives, FLONHS.

129. Photographs #673-41, 673-42, 673-50, Album #1, Archives, FLONHS.

130. Plan #673-1, Archives, FLONHS.

131. Plan #673-8, Archives, FLONHS.

132. Plan #673-1, Archives, FLONHS.

133. Photographs #673-38, 673-45, 673-58, 673-106, Album #1, Plan #673-8, Archives, FLONHS.

134. Memo dated between 1903-1905, Planting File #673, Archives, FLONHS.

135. Plan #673-56, Archives, FLONHS.

136. Planting List to accompany Plan #673-56, with notes, Planting File #673, Archives, FLONHS.

137. Notes by Hans Koehler, Planting File #673, Archives, FLONHS.

138. Hudak Interview, op. cit.

139. Ibid.

140. Town of Brookline Building Permit Records, 1968; Plan #673-1 (updated), Archives, FLONHS.

141. Plan for Vegetable and Herb Garden by Nicky Richardson, Planting File #673, Archives, FLONHS.

142. Hudak Interview, op. cit.

143. Plan #673-20, Archives, FlONHS.

144. Photograph #62, Album #1, JCO Collection, Harvard University; Photographs #2919-49, 2919-46, 673-4, 673-24, Archives, FLONHS.

145. Plan #673-20, Archives, FLONHS.

146. Photograph #673-100, 673-101, 673-152, Albums #1 and 2, Archives, FLONHS.

147. Plan #673-1, Archives, FLONHS.

148. Plan #673-45, Archives, FLONHS.

149. Ibid; Planting List to accompany Plan #673-45, dated 1926 Planting File #673, Archives, FLONHS.

150. Photograph #673-133, Album #2, Archives, FLONHS.

151. Order Sheet for Plantings dated October, 1926, Planting File #673, Archives, FLONHS.

152. Memo dated 1939, Planting File #673, Archives, FLONHS.

153. Plan #673-1, Archives, FLONHS.

154. Photograph #673-60, Album #1, Archives, FLONHS.

155. Hudak Interview, op. cit.

156. Ibid.

157. Ibid.

158. Plan #673-1H, Archives, FLONHS.

159. Photograph #673-4, Album #1, Archives, FLONHS.

160. Memo, Planting File #673, Archives, FLONHS.

161. Hudak Interview, op. cit.

162. Three photographs of office wing construction, small brown envelope, JCO Collection, FLL, Harvard University.

163. Hudak Interview, op. cit.

164. Plan #673-1, Archives, FLONHS.

165. Plan #673-43, Archives, FLONHS.

166. Photographs of plan models found throughout Olmsted Brothers Project Albums, Archives, FLONHS.

167. Hudak Interview, op cit.

168. Plan #673-1, Archives, FLONHS.

169. Plan #673-8, Archives, FLONHS.

170. Plan #673-40, plan #673-47, Archives, FLONHS.

171. Photograph #673-158, Unnumbered negative in Photograph File #673, Archives, FLONHS.

172. Memo, Planting File, #673, Archives, FLONHS.

173. Sketch plan of Office Courtyard, Planting File #673, Archives, FLONHS.

174. Hudak Interview, op. cit.

175. Ibid.

176. Unnumbered photographs at end of #673 Album #1, 1963-65, Archives, FLONHS.

177. Hudak Interview, op. cit.

178. Frederick Law Olmsted, Jr. to Mr. Gardner, letter dated June 19, 1933, File #2919, F. L. Olmsted Papers, Library of Congress, Washington, D.C.

APPENDICES

APPENDIX A

Plans Related To The Landscape

File #673, Archives, FLONHS

1847	(15)	Outline Survey, 1 paper (rcvd. 1902 by firm).
pre-1883	(1H)	House, barn, property - topo, 1 cloth.
c. 1882-3		Clark Place field notes, 1 paper, House sections, 1 trace.
pre-1884		Clark Place - study for front fence, 1 cloth.
mid-1880's	(16H)	Drainage Plan, 1 paper.
prob 1880's	(17H)	Archway design, tracing paper, 1 cloth.
c. 1887-89	(20)	Plan of walks and roads. Outline of estate, 1 cloth.
c. 1895	(20)	Outlines of estate, 2 cloth, 1 blue.
1904	(1)	Plan of F. L. Olmsted Estate, 1 cloth, Whyte and Wetherbee, Civil Engineers.
1904	(2)	Layout of planting plan and office, 2 sheets paper, Hubbard.
1904	(3)	Plan showing present conditions, 1 paper, Hubbard.
1904	(2)	Planting Plan with alterations/conditions.
1905	(4)	Profile of curb at front entrance, Gibbs.
N.D.	(1)	Update of 1904 topo, 1 cloth, showing parking space, board fence, shed addition to stable-post 1904.
1910 1923	(8)	Additional planting study - update on 1904 topo - Koehler.
1911	(?)	Office courtyard, Trace.
1912	(23)	Diagram for Soil Analysis for new road (turn in front of house,) paper, Keeling.
1914	(24)	Study of J.C.O. Lotting of estate, 1 paper.
1915	(1)	Definition of Thompson property conveyed and leased by Olmsted Estate to Thompson (on blue of 1904 topo), 1 blue.

File #673 (cont.), Archives, FLONHS

1916 (26) Planting Study and field notes - Sunken Garden, Canning, 1 trace, 1 paper.

1920 (32) Map showing ownership in 1920 of the original Clark property, 2 paper (waxed).

1923 (33) Hollow planting plan, 1 blue, 1 cloth, Koehler.

1924 (36) Planting about Path in S.E. corner of Lawn, trace, brown.

1924 (37) Profile of steps into Hollow, 1 paper, Douglas.

1924 (38) Steps down into Hollow, planting study, 1 trace, Koehler.

1924 (39) Planting plan for steps into Hollow, 1 trace, Koehler.

1925 (40) Courtyard planting study, trace, Koehler.

1925 (42) Location of lilies in Hollow, planted in fall, trace, Lavalle.

1926 (43) Service Yard Planting, trace, Lavalle.

1926 (44) Iris locations in Hollow, trace, Lavalle.

1926 (45) Lower garden planting of annuals, trace, Carpenter.

1926 (47) Planting in vicinity of plans vault, trace, Lavalle.

1926 (48) Rock Garden (S.E. corner of property) additional plants not showing on original survey, 1 cloth, Brown and Lavalle.

1927 (49) Tulips in Hollow location as planted, trace, Barnes.

1929 (1) Second purchase by Thompson (on blue of 1904 topo).

1934 (54) Planting of bulbs in Hollow, trace, Koehler.

1938 (56) Plan for tulip planting above garage, trace, Koehler.

File #20, Archives, FLONHS

1902 (14) Design for office court, 1 cloth.

1955 (49) Updates of 1904 topo plan, 1 cloth, Riley.

APPENDIX B

Plant Species at Fairsted (1981)

TREES, SHRUBS, AND VINES

Acer palmatum	Japanese Maple	I*
Acer pensylvanicum	Striped Maple, Moosewood	N
Acer platanoides	Norway Maple	N-I
Acer platanoides 'Schwedleri'	Red Norway Maple	I
Acer pseudoplatanus	Planetree Maple, Sycamore Maple	I
Acer saccharum	Sugar Maple	N
Aesculus Hippocastanum	Common Horsechestnut	I
Albizia Julibrissin	Silktree, Mimosa	I
Aralia spinosa	Devil's-Walkingstick	N
Berberis Thunbergii	Japanese Barberry	I
Berberis vulgaris	Native Barberry	I
Betula lenta	Sweet Birch	N
Betula papyrifera	Paper Birch, White Birch	N
Buxus sempervirens	Common Box, Boxwood	I
Calycanthus floridus	Strawberry Shrub, Carolina allspice	N
Carya ovata	Shagbark Hickory	N
Cercidiphyllum japonicum	Katsuratree	I
Chaenomeles speciosa	Japanese Flowering Quince	I
Chamaecyparis obtusa	Hinoki False Cypress	I
Chamaecyparis pisifera 'Filifera'	Thread-leaf False Cypress	I
Cladrastis lutea	American Yellowwood	N
Clethra alnifolia	Summersweet, Clethra	N
Cornus florida	Flowering Dogwood	N
Cornus kousa	Kousa Dogwood	I
Cotoneaster apiculata	Cranberry Cotoneaster	I
Crataegus 'Toba'	Toba Hawthorn	I
Cydonia Sinensis	Fruiting Quince	I
Deutzia scabra	Fuzzy Deutzia	I
Enkianthus campanulatus	Redvein Enkianthus	I
Euonymus alatus	Winged Euonymus, Burning Bush	I
Euonymus Fortunei	Wintercreeper Euonymus	I
Euonymus Fortunei 'Carrierei'	Wintercreeper Euonymus	I
Euonymus Fortunei var. radicans	Wintercreeper Euonymus	I
Euonymus Fortunei 'Vegeta'	Wintercreeper Euonymus	I

* Native (N), Introduced (I), Naturalized-Introduced (N-I). Naturalized-Introduced species are defined as those plants which are not native to the United States, and have escaped cultivation by reseeding themselves extensively so as to appear 'naturalized' or native.

Fraxinus americana	White Ash	N
Gleditsia triacanthos var. inermis	Thornless Common Honeylocust	N
Hedera Helix ('Baltica')	English Ivy	I
Hydrangea petiolaris (H. anomala subsp. petiolaris)	Climbing Hydrangea	I
Kalmia Latifolia	Mountain-laurel	N
Leucothoe Fontanesiana (Catesbaei)	Drooping Leucothoe, Fetterbush	N
Ligustrum obtusifolium Regalianum	Regal Privet	I
Liriodendron Tulipifera	Tuliptree, Tulip Poplar, Whitewood	N
Lonicera tatarica	Tatarian Honeysuckle	I
Magnolia acuminata	Cucumbertree Magnolia	N
Malus (species)	Apple, Crabapple	N-I
Menispermum canadense	Moonseed, Moonvine	N
Parthenocissus quinquefolia	Virginia Creeper, Woodbine	N
Phellodendron amurense	Amur Corktree	N-I
Philadelphus coronarius	Sweet Mockorange	I
Pieris floribunda	Mountain Pieris	I
Pieris japonica	Japanese Pieris, Andromeda	I
Pinus strobus	White Pine	N
Populus deltoides	Eastern Poplar, Cottonwood	N
Prunus avium	Sweet Cherry	I
Prunus virginiana	Common Chokecherry	N
Pyracantha coccinea	Scarlet Firethorn	I
Pyrus communis	Common Pear	I
Quercus rubra	Red Oak	N
Rhamnus cathartica	Common Buckthorn	N-I
Rhamnus Frangula	Glossy Buckthorn, Alder Buckthorn	N-I
Rhododendron calendulaceum	Flame Azalea	N
Rhododendron catawbiense	Catawba Rhododendron	N
Rhododendron x gandavense	Ghent Azalea	I
Rhododendron Kaempferi	Torch Azalea	I
Rhododendron maximum	Rosebay Rhododendron	N
Rhododendron obtusum	Hiryu Azalea	I
Rhododendron Vaseyi	Pinkshell Azalea	N
Rhododendron x cv. Wilsonii	Wilson Rhododendron	I

Rhododendron yedoense poukhanense	Korean Azalea	I
Rhodotypos scandens	Jetbead	N-I
Robinia Pseudoacacia	Black Locust, Common Locust	N
Rosa (species)	Rose	I
Rubus Allegheniensis	Blackberry	N
Rubus idaeus	Raspberry	N
Sambucus canadensis	American Elder, Elderberry	N
Sorbus Aucuparia	European Mountainash	N-I
Spiraea Thunbergii	Spirea	I
Spiraea x Vanhouttei	Bridle wreath, Vanhoutte Spirea	I
Symphoricarpos x Chenaultii	Chenault Coralberry	I
Syringa x chinensis 'Alba'	White Chinese Lilac	I
Syringa x Prestoniae 'Isabelle'	Preston hybrid Lilac	I
Syringa vulgaris	Common Lilac	I
Taxus baccata 'Repandens'	English Weeping Yew	I
Taxus canadensis	Ground Hemlock, American Yew	N
Taxus cuspidata	Japanese Yew	I
Taxus cuspidata 'Nana'	Dwarf Japanese Yew	I
Taxus cuspidata 'Nana Capitata'	Pyramid Dwarf Japanese Yew	I
Taxus x media 'Hatfieldi'	Hatfield Anglojap Yew	I
Tilia americana	American Linden	N
Tsuga canadensis	Canadian Hemlock	N
Tsuga caroliniana	Carolina Hemlock	N
Ulmus americana	American Elm	N
Viburnum dentatum	Arrowwood	N
Viburnum dilatatum	Linden Viburnum	I
Viburnum Lentago	Nannyberry Viburnum	N
Viburnum plicatum var. tomentosum	Doublefile Viburnum	I
Viburnum setigerum	Tea Viburnum	I
Vitis Labrusca	Fox Grape	N
Vitis vinifera	Wine Grape	I
Wisteria floribunda	Japanese Wisteria	I

HERBACEOUS PLANTS

Achillea filipendulina cv.	Tansy; Yellow Yarrow	I*
Achillea Millefolium cv.	Red Yarrow	I
Aegopodium Podograria	Goutweed	N-I
Ajuga reptans	Ajuga; Bugleweed	N
Allium Schoenoprasum	Chives	I
Allium tuberosum	Garlic Chives	I
Anchusa azurea	Italian Bugloss	I
Arisaema triphyllum	Jack-In-The-Pulpit	N
Artemesia ludoviciana var. albula	Wormwood, Silver Artemesia	I
Aruncus dioicus	Goatsbeard	I
Asclepias tuberosa	Butterfly Milkweed	N
Aster novae-angliae	New England Aster	N
Astilbe Arendsii	Astilbe	I
Bergenia cordifolia	Bergenia	I
Brassica sp.	Wild Mustard	N-I
Campanula rapunculoides	Bellflower	I
Chamaemelum nobile	Chamomile	N
Commelina communis	Asiatic Dayflower	N-I
Convallaria majalis	Lily-of-the-Valley	N
Coreopsis verticillata	Yellow Coreopsis	N
Crocus sp.	Spring Crocus	I
Daucus carota	Queen Anne's Lace, Wild Carrot	N-I
Dicentra eximia	Bleeding Heart	N
Dictamnus albus	Gas Plant	I
Dipsacus fullonum	Common Teasle	N
Echinops sp.	Globe Thistle	I
Epimedium grandiflorum	Yellow Epimedium	I
Epimedium x rubrum	Red Epimedium	I
Fragaria vesca	Woodland Strawberry	N-I
Galium odoratum	Sweet Woofruff	I
Glechoma hederacea	Ground Ivy	I

* Native (N), Introduced (I), Naturalized-Introduced (N-I)

Helianthus x multiflorus	Sunflower (Double)	I
Hemerocallis sp.	Daylily	N-I
Hosta lancifolia	Narrow-leaved Plantain Lily	I
Hosta plataginea	Fragrant Plantain Lily	I
Hosta ventricosa	Hosta, Plaintain Lily	I
Iris sp.	Iris	I
Leucojum vernum	Spring Snowflake	I
Lilium sp.	Hardy Lily	I
Lysimachia ramosa	Whorled Loosestrife	N
Lythrum alicaria	Purple Loosestrife	N
Matricaria recutita	Sweet False Chamomile	I
Matteuccia Struthiopteris	Ostrich Fern	N
Mentha sp.	Mint	N-I
Mertensia virginica	Virginia Bluebells	N
Monarda didyma	Oswego Tea; Bee Balm	N
Monarda fistulosa	Wild Bergamot	N
Monarda sp.	Purple Bergamot	N
Narcissus sp.	Daffodil	I
Ornithogalum umbellatum	Star-of-Bethlehem	I
Pachysandra terminalis	Pachysandra; Japanese Spurge	I
Paeonia officinalis	Peony	I
Papaver orientale	Oriental Poppy	I
Phlox paniculata	Perennial Phlox	N
Platycodon grandiflorus	Balloonflower	I
Polemonium Caeruleum subsp. Van-bruntiae	Jacob's Ladder	N
Polygonatum biflorum	True Soloman's Seal	N
Polygonum cuspidatum	Japanese Knotweed	I
Polygonum pennsylvanicum (P. macrophyllum)	Pink Knotweed	N
Pulmonaria angustifolia	Lungwort	I
Salvia x superba 'Sage'	Blue Sage	I
Saponaria officinalis	Soapwort; Bouncing Bet	I
Scilla siberica	Siberian Squill	I
Smilacina racemosa	False Soloman's Seal	N
Solidago sp.	Goldenrod	N-I

Tradescantia virginiana	Common Spiderwort	N
Trillium grandiflorum	Wake-Robin, White Trillium	N
Tulipa sp.	Tulip	I
Veronica officinalis	Common Speedwell	I
Vinca minor	Vinca; Myrtle	I
Viola odorata	Sweet Violet	I
Viola tricolor	Johnny-Jump-Up	I
Zinnia elegans	Zinnia	I

APPENDIX C

Replacement Alternatives For Select Plants*

1. Carya ovata:
   - Sophora japonica (texture)
   - Cladrastis lutea (texture, size)
   - Liquidamber styraciflua (habit)
   - Fraxinus species (texture, habit)

2. Cornus florida:
   - Cercis siliquastrum (size, habit)
   - Cercis canadensis (size, habit)
   - Malus species (flower color, size)
   - Amelanchier arborea (size, flower color)
   - Amelanchier laevis (size, flower color)

3. Liriodendron tulipifera:
   - Ulmus carpinifolia (size, habit, texture)
   - Quercus species (size, habit)
   - Acer species (texture)
   - Magnolia virginiana (size)
   - Tilia species (habit, size)

4. Quercus rubra:
   - other Quercus species (texture, size, habit)
   - Ulmus species (resistant varieties) (texture, size)
   - Magnolia virginiana (size, texture)
   - Acer species (size)

5. Tsuga canadensis:
   - Pseudotsuga menziesii (texture, habit)
   - Tsuga caroliniana (texture, habit, size)
   - Picea orientalis (habit)
   - Chamaecyparis species (size, habit, texture)

6. Magnolia acuminata:
   - Cercidiphyllum japonica (habit, size)
   - Phellodendron amurense (habit, size)
   - Magnolia species (habit, size, texture)

7. Pinus strobus:
   - Pinus resinosa (habit, size, texture)
   - Pinus thunbergii (habit, size)

*Those plants listed are not in priority order.

8. Ulmus americana:
   Gleditsia triacanthos (formerly recommended) (size, habit)
   Zelkova serrata (texture, habit, size)
   Ulmus carpinifolia, and other resistant elm species (size, habit, texture)

9. Hydrangea petiolaris:
   Euonymus fortunei - various forms (previously in location)
   Parthenocissus quinquefolia (texture, size)
   Hedera helix 'Baltica' (planted on north side in 1935)

APPENDIX D

Plants In Bloom

BOTANICAL NAME	COMMON NAME	LOCATION
April - week 3-4		
Crocus sp.	Spring Crocus	Perennial Garden
Leucojum vernum	Spring Snowflake	Perennial Garden
Narcissus sp.	Daffodil	Perennial Garden
Ornithogalum umbellatum	Star-of-Bethlehem	Rock Garden
Scilla siberica	Siberian Squill	Rock Garden
May - week 1		
Acer sp.	Maples	General Grounds
Ajuga reptans	Bugloss	General Grounds
Anchusa myosotides	Anchusa	Herb Garden
Arisaema triphyllum	Jack-In-The-Pulpit	Hollow
Berberis Thunbergii	Japanese Barberry	Front Driveway
Betula sp.	Birches	General Grounds
Chaenomeles speciosa	Japanese Flowering Quince	Front Driveway
Cornus florida	Flowering Dogwood	Hollow
Crataegus 'Toba'	Toba Hawthorne	Hollow
Epimedium grandiflorum	Yellow Epimedium	Hollow
Epimedium x rubrum	Red Epimedium	Hollow
Fragaria vesca	Woodland Strawberry	Herb Garden
Lonicera tatarica	Tatarian Honeysuckle	Hollow
Malus sp.	Apples and Crabapples	General Grounds
Mertensia virginica	Virginia Bluebells	Herb Garden
Ornithogalum umbellatum	Star-of-Bethlehem	Herb Garden
Pieris floribunda	Mountain Pieris	Rock Garden, South Lawn
Pieris japonica	Japanese Pieris	South Lawn
Polemonium caeruleum subsp. Van-bruntiae	Jacob's Ladder	Hollow
Saponaria officinalis	Soapwort, Bouncing Bet	Herb Garden
Syringa vulgaris	Common Lilac	Parking Lot
Trillium grandiflorum	White Trillium	Hollow
Vinca minor	Vinca, Myrtle	General Grounds
Viola odorata	Sweet Violet	Rear Lawn

May - week 2

Ajuga reptans	Bugloss	General Grounds
Calycanthus floridus	Strawberry Shrub	Front Driveway
Convallaria majalis	Lily-of-the-Valley	Parking Lot
Cornus florida	Flowering Dogwood	Hollow
Dicentra eximia	Bleeding Heart	Hollow
Enkianthus campanulatus	Redvein Enkianthus	Parking Lot
Epimedium grandiflorum	Yellow Epimedium	Hollow
Epimedium x rubrum	Red Epimedium	Hollow
Glechoma hederacea	Ground Ivy	General Grounds
Lonicera tatarica	Tatarian Honeysuckle	Hollow
Ornithogalum umbellatum	Star-of-Bethlehem	Perennial Garden
Polemonium caeruleum subsp. Van-bruntiae	Jacob's Ladder	Hollow
Polygonatum biflorum	True Soloman's Seal	Front Driveway
Rhododendron obtusum	Hiryu Azalea	Hollow
Rhododendron Vaseyi	Pinkshell Azalea	Hollow
Rhodotypos scandens	Jetbead	General Grounds
Saponaria officinalis	Soapwort; Bouncing Bet	Herb Garden
Spirea x Vanhouttei	Vanhoutte Spirea; Bridlewreath	Rear Lawn
Syringa vulgaris	Common Lilac	Parking Lot
Trillium grandiflorum	White Trillium	Hollow

May - week 3

Allium Schoenoprasum	Chive	Herb Garden
Allium tuberosum	Garlic Chive	Herb Garden
Calycanthus floridus	Strawberry Shrub	Front Driveway
Cornus florida	Flowering Dogwood	Hollow
Dictamnus albus	Gas Plant	Hollow
Enkianthus campanulatus	Redvein Enkianthus	Parking Lot
Epimedium grandiflorum	Yellow Epimedium	Hollow
Epimedium x rubrum	Red Epimedium	Hollow
Glechoma hederacea	Ground Ivy	General Grounds
Lonicera tatarica	Tatarian Honeysuckle	Hollow
Ornithogalum umbellatum	Star-of-Bethlehem	Perennial Garden
Polemonium caeruleum subsp. Van-bruntiae	Jacob's Ladder	Hollow
Pulmonaria angustifolia	Lungwort	Herb Garden
Rhamnus cathartica	Common Buckthorn	Parking Lot
Rhamnus frangula	Alder Buckthorn	Front Driveway
Rhododendrons sp.	All Rhododendrons	Hollow; Rock Garden
Rhodotypos scandens	Jetbead	Rock Garden
Spiraea x Vanhouttei	Bridlewreath	Rear Lawn
Trillium grandiflorum	White Trillium	Hollow

May - week 4

Allium Schoenoprasum	Chive	Herb Garden
Allium tuberosum	Garlic Chive	Herb Garden
Calycanthus floridus	Strawberry Shrub	Front Driveway
Dictamnus albus	Gas Plant	Hollow
Epimedium sp.	Red and Yellow Epimedium	Hollow
Glechoma hederacea	Ground Ivy	General Grounds
Iris sp.	Iris	General Grounds
Leucothoe Fontanesiana	Drooping Leucothoe	South Lawn
Liriodendron tulipifera	Tulip Tree	Hollow
Magnolia acuminata	Cucumbertree Magnolia	Rock Garden
Ornithogalum umbellatum	Star-of-Bethlehem	Perennial Garden
Paeonia sp.	Peony	South Lawn
Philadelphus coronarius	Mock Orange	General Grounds
Rhododendrons sp.	Rhododendrons	Hollow
Rubus allegheniensis	Blackberry	General Grounds
Rubus idaeus	Raspberry	General Grounds
Smilacina racemosa	False Soloman's Seal	Rock Garden
Syringa x Prestoniae 'Isabelle'	Preston hybrid Lilac	Rear Lawn
Tradescantia virginiana	Spiderwort	General Grounds

June - week 1

Achillea Millefolium cv.	Red Yarrow	Herb Garden
Aegopodium Podograria	Goutweed	General Grounds
Aruncus dioicus	Goatsbeard	Office Courtyard
Cornus Kousa	Kousa Dogwood	Perennial Garden
Dictamnus albus	Gas Plant	Hollow
Hydrangea petiolaris	Climbing Hydrangea	Office Courtyard
Iris sp.	Iris	General Grounds
Kalmia latifolia	Mountain Laurel	Rock Garden
Liriodendron tulipifera	Tulip Tree	Hollow
Paeonia officinalis	Peony	South Lawn
Papaver orientale	Oriental Poppy	Rock Garden
Philadelphus coronarius	Mock Orange	General Grounds
Pulmonaria angustifolia	Lungwort	Herb Garden
Pyracantha coccinea	Firethorn	South Lawn
Rubus allegheniensis	Blackberry	General Grounds
Tradescantia virginiana	Spiderwort	General Grounds

June - week 2

Achillea Millefolium cv.	Red Yarrow	Herb Garden
Aegopodium Podograria	Goutweed	General Grounds
Aruncus dioicus	Goatsbeard	Office Courtyard
Cornus Kousa	Kousa Dogwood	Rock Garden

June - week 2 (cont)

Euonymus Fortunei cv.	Wintercreeper Euonymus	General Grounds
Hydrangea petiolaris	Climbing Hydrangea	Office Courtyard
Iris sp.	Iris	General Grounds
Kalmia latifolia	Mountain Laurel	Rock Garden
Lysimachia ramosa	Whorled Loosestrife	Herb Garden
Paeonia officinalis	Peony	South Lawn
Papaver orientale	Oriental Poppy	Rock Garden
Philadelphus coronarius	Mock Orange	General Grounds
Pyracantha coccinea	Firethorn	South Lawn
Rhododendron sp.	Rhododendrons and Azaleas	Hollow; Rock Garden
Rosa sp.	Rose	Herb Garden
Tradescantia virginiana	Spiderwort	General Grounds
Vitis labrusca	Foxgrape	Parking Lot

June - week 3

Achillea Millefolium cv.	Red Yarrow	Herb Garden
Aegopodium Podograria	Goutweed	General Grounds
Aruncus dioicus	Goatsbeard	Office Courtyard
Brassica sp.	Wild Mustard	General Grounds
Cornus Kousa	Kousa Dogwood	Perennial Garden
Euonymus Fortunei cv.	Wintercreeper Euonymus	General Grounds
Hydrangea petiolaris	Climbing Hydrangea	Office Courtyard
Kalmia latifolia	Mountain Laurel	Rock Garden
Lysimachia ramosa	Whorled Loosestrife	Herb Garden
Paeonia officinalis	Peony	South Lawn
Papaver orientale	Oriental Poppy	Perennial Garden
Rhododendron maximum	Rosebay Rhododendron	Hollow
Rhododendron x Wilsonii	Wilson Rhododendron	Hollow
Rosa sp.	Rose	Herb Garden
Salvia x superba 'Sage'	Blue Salvia	Perennial Garden
Symphoricarpos x Chenaultii	Chenault Coralberry	Parking Lot
Tradescantia virginiana	Spiderwort	General Grounds
Viburnum dentatum	Arrowwood	General Grounds
Viola tricolor	Johnny-Jump-Up	Perennial Garden

June - week 4

Achillea filipendulina cv.	Yellow Fernleaf Yarrow	Perennial Garden
Achillea Millefolium	Red Yarrow	Perennial Garden
Aegopodium podograria	Goutweed	General Grounds
Brassica sp.	Wild Mustard	General Grounds
Campanula rapunculoides	Bellflower	Herb Garden
Chamaemelum nobile	Chamomile	Herb Garden
Cornus Kousa	Kousa Dogwood	Perennial Garden
Deutzia scabra	Fuzzy Deutzia	Rear Lawn

June - week 4 (cont)

Helianthus x multiflorus	Double Sunflower	Herb Garden
Hemerocallis sp.	Daylily	General Grounds
Iris sp.	Iris	General Grounds
Kalmia latifolia	Mountain Laurel	Rock Garden
Lysimachia ramosa	Whorled Loosestrife	Herb Garden
Lythrum Salicaria	Purple Loosestrife	Perennial Garden
Rosa sp.	Rose	Herb Garden
Salvia x superba 'Sage'	Blue Salvia	Perennial Garden
Tradescantia virginiana	Spiderwort	General Grounds
Viburnum dentatum	Arrowwood	General Grounds
Viola tricolor	Johnny-Jump-Up	Perennial Garden

July - week 1

Achillea filipendulina cv.	Yellow Yarrow	Perennial Garden
Asclepias tuberosa	Butterfly Milkweed	Perennial Garden
Astilbe x Arendsii	Astilbe	Office Courtyard
Campanula rapunculoides	Bellflower	Herb Garden
Coreopsis verticillata	Yellow Coreopsis	Perennial Garden
Helianthus x multiflorus	Double Sunflower	Herb Garden
Hemerocallis sp.	Daylily	General Grounds
Hosta sp.	Hostas	Hollow
Lilium sp.	Hardy Lily	Perennial Garden
Lythrum Salicaria	Purple Loosestrife	Perennial Garden
Rosa sp.	Rose	South Lawn
Veronica officinalis	Speedwell	Hollow
Viola tricolor	Johnny-Jump-Up	Perennial Garden
Zinnia elegans	Zinnia	Herb Garden

July - week 2

Achillea filipendulina cv.	Yellow Yarrow	Perennial Garden
Asclepias tuberosa	Butterfly Milkweed	Perennial Garden
Campanula rapunculoides	Bellflower	Herb Garden
Coreopsis verticillata	Yellow Coreopsis	Perennial Garden
Helianthus x multiflorus	Double Sunflower	Herb Garden
Hemerocallis sp.	Daylily	General Grounds
Hosta sp.	Hostas	Hollow
Lythrum Salicaria	Purple Loosestrife	Perennial Garden
Monarda didyma	Bee Balm	Hollow
Monarda fistulosa	Wild Bergamot	Hollow
Phlox paniculata	Perennial Phlox	Hollow
Veronica officinalis	Speedwell	Hollow
Zinnia elegans	Zinnia	Herb Garden

July - week 3

Achillea filipendulina cv.	Yellow Yarrow	Perennial Garden
Allium Schoenoprasum	Chive	Herb Garden
Coreopsis verticillata	Yellow Coreopsis	Perennial Garden
Dipsacus fullonum	Teasle	Herb Garden
Helianthus x multiflorus	Double Sunflower	Herb Garden
Hosta sp.	Hostas	Hollow
Monarda fistulosa	Wild Bergamot	Hollow
Phlox paniculata	Perennial Phlox	Hollow
Rosa sp.	Rose	Herb Garden
Tradescantia virginiana	Spiderwort	General Grounds
Zinnia elegans	Zinnia	Herb Garden

July - week 4

Achillea filipendulina cv.	Yellow Yarrow	Perennial Garden
Allium Schoenoprasum	Chive	Herb Garden
Clethra alnifolia	Summersweet	Hollow
Helianthus x multiflorus	Double Sunflower	Herb Garden
Hemerocallis sp.	Daylily	General Grounds
Hosta sp.	Hostas	Hollow
Monarda fistulosa	Wild Bergamot	Hollow
Phlox paniculata	Perennial Phlox	Hollow
Rosa sp.	Rose	Herb Garden
Veronica officinalis	Speedwell	Hollow
Zinnia elegans	Zinnia	Herb Garden

August - week 1

Achillea filipendulina cv.	Yellow Yarrow	Perennial Garden
Aralia spinosa	Devil's Walkingstick	Rock Garden
Clethra alnifolia	Summersweet	Hollow
Coreopsis verticillata	Yellow Coreopsis	Perennial Garden
Hosta sp.	Hostas	Hollow
Mentha sp.	Mints	Herb Garden
Monarda fistulosa	Wild Bergamot	Hollow
Phlox paniculata	Perennial Phlox	Hollow
Platycodon grandiflorus	Balloonflower	Perennial Garden

August - week 2

Achillea filipendulina cv.	Yellow Yarrow	Perennial Garden
Aralia spinosa	Devil's Walkingstick	Rock Garden
Aster novae-angliae	New England Aster	General Grounds
Helianthus x multiflorus	Double Sunflower	Herb Garden

August - week 2 (cont)

Hosta sp.	Hostas	Hollow
Mentha sp.	Mints	Herb Garden
Monarda fistulosa	Wild Bergamot	Hollow
Phlox paniculata	Perennial Phlox	Hollow
Platycodon grandiflorus	Balloonflower	Perennial Garden
Solidago sp.	Goldenrod	Perennial Garden
Zinnia elegans	Zinnia	Herb Garden

August - week 3-4

Allium Schoenoprasum	Chive	Herb Garden
Allium tuberosum	Garlic Chive	Herb Garden
Aster novae-angliae	New England Aster	General Grounds
Hosta sp.	Hostas	Hollow
Mentha sp.	Mints	Herb Garden
Phlox paniculata	Perennial Phlox	Hollow
Rosa sp.	Rose	Herb Garden
Zinnia elegans	Zinnia	Herb Garden

September

Summer flowers reach their peak and fade.
Chrysanthemums in the herb garden come into bloom.
Fall color increases as the month progresses.

APPENDIX E

Horticultural Information Sources

1. Arnold Arboretum
   The Arborway
   Boston, Mass.
   phone: 524-1718; (524-1721 for horticultural information 1-2 p.m.)
   contact: Gary Koller
   services: identification of plant species; library; well-labelled plant collection; weed and pest control information.

2. Suburban Experiment Station
   Beaver Street
   Waltham, Mass.
   phone: 891-0650
   contact: staff
   services: Soil and tissue analysis, pest disease control; plant identification; spray program schedules; horticulture information sheets and booklets available at no cost.

3. Massachusetts Horticultural Society
   Massachusetts Avenue
   Boston, Mass.
   phone: 536-9280 (office)
   536-9635 (hot line)
   contact: staff
   services: courses of instruction; library; bookstore; information related to house plants.

4. Massachusetts Department of Agriculture
   100 Cambridge Street
   Boston, Mass.
   phone: 727-3031
   contact: staff
   services: pest and disease control

5. Harvard University
   Frances Loeb Library GSD
   Cambridge, Mass.
   phone: 495-2574
   contact: Angela Giral
   services: John Charles Olmsted archives - letters and photographs related to history of Fairsted and other Olmsted designs; large collection of books relevant to history of design, standards of landscape design, etc.

6. State Pesticide Coordinator
University of Massachusetts
Fernald Hall
Amherst, Mass.
phone: (413) 545-0932
contact: Roy Van Dreische
services: information related to currently approved pesticides and their proper use.

7. Massachusetts Pesticide Control Board
Boston, Mass.
phone: 727-7712
contact: Lew Wells
services: information related to approved pesticides and their proper use.

APPENDIX F

Partial List of Chemical Controls*

1. Arsenate of Lead - a stomach poison insecticide historically used to control chewing insects - used when pests become resistant to other stomach poisons. Could be combined with Bordeaux mix and others. Discussed by Hans Koehler for use in hollow; not recommended for use today.

2. Bordeaux mix - a fungicide developed in the French Bordeaux region. This fungicide has found general acceptance for a wide variety of plant material. The mix is a combination of copper sulphate, hydrated lime, and water. It can be mixed in varying concentrations but the standard mix is: 4 pounds copper sulphate; 4 pounds hydrated lime and 50 gallons of water. Lower concentrations of lime may be necessary for those plants whose leaves are burned by high concentrations of lime.

3. Captan - a fungicide often used to clean hospital rooms when patients are allergic to algaes. Often recommended for use on apple scab, black spot and similar fungal diseases.

4. Cygon - a systemic insecticide used to control insects on azaleas, rhododendrons, camellias, gardenia, birch boxwood and holly. It must be used only for those plants listed on the container as some plants are injured by this chemical.

5. Fermate - same as Ferbam.

6. Ferbam - a carbamate fungicide often recommended for control of black spot and cedar apple rust on crabapples.

7. Malathion - an organic phosphate insecticide used to control a wide variety of pests. Cythion is a higher grade of this chemical with a lower odor content. This pesticide is toxic to bees, but is otherwise of relatively low toxicity.

8. Maneb - this fungicide also goes under the name of Dithane, M-22, Manzate and ChemNab. It is most effective on leaf spot diseases on ornamental trees and turf grasses.

*Approved by the State of Massachusetts for 1981 unless otherwise indicated.

9. Methoxychlor - this insecticide is considered a substitute for, and is a close relative of DDT, but it is much less toxic. It is often used in combination with Malathion to control the Elm Bark Beetle and thereby prevent the spread of Dutch Elm Disease. If this chemical is used near a food crop, those crops must not be harvested until 14 days after the application. Methoxychlor is not harmful to bees.

10. Sevin (carbaryl) - used as a control for insects infesting ornamental trees and shrubs, use of this insecticide by itself may increase the occurrence of spider mites. For this reason, Sevin is often combined with Kelthane, an effective miticide. Sevin is toxic to bees and may cause defoliation of Boston Ivy and Virginia Creeper.

APPENDIX G

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SUMMARY OF EVENTS

LOCATION	1883 - 1903	1904 - 1935	1936 - 1963	1964 - 1980
1. Hollow	1883-retaining wall installed; planting begun 1883-1890-stone wall built from north slope to ledge; steps installed, path laid out 1889-1st office addition 1891-2nd office addition, definition of west hollow border complete; path redesigned as circular	1911-some new plants added 1916-field notes taken for hollow 1923-hollow redone 1924/25-steps to hollow reconstructed 1925-lilies added 1926-iris added 1927-bulbs added 1934-bulbs added 1935-euonymus replanted on fence 1937-bulbs planted	1950's-Joe Hudak replants some areas with daylilies, azaleas and seasonal perennials	
2. Front Drive	1883/84-driveway designed and planted; archway built By 1890-arch covered with euonymus	1935-euonymus replanted on Warren Street fence and over arch	1936-epimedium added to south side of driveway	c.1960-arch collapsed in snow; sycamore maple planted 1959-Mr. Craig complains about poor maintenance of area 1967-Carolina hemlocks added to front fence
3. Rock Garden	1884-yuccas, low shrubs and perennials in this area	1910-perennials added 1924-rock garden redesigned		
4. South/Rear Lawn	1883-stable and fence moved close to house; driveway removed 1884-plant room added; plantings begun at fence and on hill; boxwood garden in front of barn By 1900-shrubs large; borders hidden by combination of shrubs, trees and perennials; kitchen addition present 1903-05-lawn redone, kitchen widened	c.1904-birches and path photographed next to shed - pretty setting c.1910-shingle roof added to conservatory 1938-bulbs planted above shed	c.1960-perennial garden added; yews and rhododendrons added to border	1968-swimming pool and terrace installed; laundry yard fence removed N.D.-stone retaining wall extended behind barn
5. Parking Lot and Rear Courtyards	c.1885-pole fence lined both sides of driveway; no vault; no office wings; plants at edge of Fairmount Street; service yards present with fences 1901-planting wing added; 1st floor and basement of vault added	1911/12-second floor added to drafting wing and vault; rear court designed and planted with bulbs, annuals and perennials 1914-annual garden and shed present 1925-courtyard redesigned with roses, peonies and yews 1926-bulbs added to rear courtyard; plan done for service yard c.1929-annual garden changed to parking lot 1935-euonymus and ivy planted on vault walls	1937-annuals planned for rectangular bed in courtyard 1939-label test performed on trunk of Norway maple	c.1961-courtyard redesigned; roof added to door entry, new plantings done

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