

BROOKLYN BOTANIC GARDEN RECORD

VOL. XXVII

JANUARY, 1938

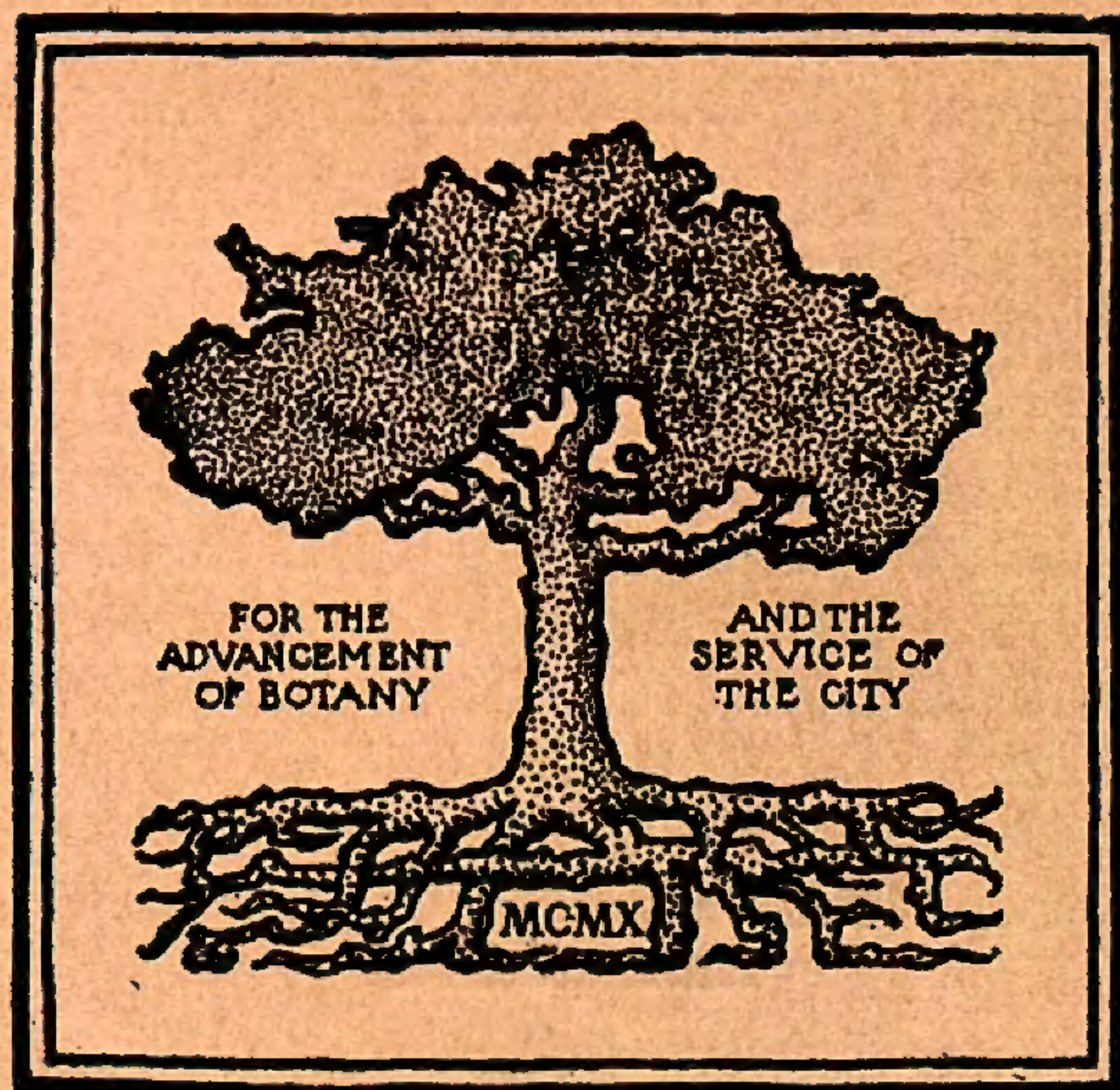
NO. 1

CONTENTS

DELECTUS SEMINUM

BROOKLYN

1937



PUBLISHED QUARTERLY
AT PRINCE AND LEMON STREETS, LANCASTER, PA.
BY THE BROOKLYN INSTITUTE OF ARTS AND SCIENCES
BROOKLYN, N. Y.

Entered as second-class matter in the post-office at Lancaster, Pa., under act of August 24, 1912

BROOKLYN BOTANIC GARDEN

Scientific, Educational, and Administrative Officers

SCIENTIFIC AND EDUCATIONAL

The Staff

C. STUART GAGER, Ph.D., Sc.D., Pd.D., *Director*
MONTAGUE FREE, Certificate, Royal Botanic Gardens, Kew, *Horticulturist*
ARTHUR HARMOUNT GRAVES, Ph.D., *Curator of Public Instruction*
ALFRED GUNDERSEN, Docteur de l'Université (Paris), *Curator of Plants*
WILLIAM E. JORDAN, B.S., *Librarian*
GEORGE M. REED, Ph.D., *Curator of Plant Pathology*
ELLEN EDDY SHAW, B.S., *Curator of Elementary Instruction*
HENRY K. SVENSON, Ph.D., *Curator of the Herbarium*
MARGARET M. DORWARD, A.B., *Assistant Curator of
Elementary Instruction*

Other Officers

MARY AVERILL, *Honorary Curator of Japanese Gardening and Floral Art*
HAROLD A. CAPARN, *Consulting Landscape Architect*

RALPH CURTISS BENEDICT, Ph.D., *Resident Investigator (Ferns)*
RALPH H. CHENEY, Sc.D., *Resident Investigator (Economic Plants)*

EMILIE PERPALL, CHICHESTER, *Library Assistant*
CHARLES F. DONEY, M.S., *Assistant in Woody Plants*
WILLIAM H. DURKIN, *Curatorial Assistant*
ELSIE TWEMLOW HAMMOND, M.A., *Instructor*
D. ELIZABETH MARCY, A.M., Ph.D., *Research Assistant*
FRANCES M. MINER,* A.B., *Instructor*
MARGARET BURDICK PUTZ, *Curatorial Assistant*
HESTER M. RUSK, A.M., *Instructor*
MARGERY H. UDELL, *Curatorial Assistant*
L. GORDON UTTER, M.S., *Research Assistant*
HILDA VILKOMERSON, A.B., *Curatorial Assistant*

LOUIS BUHLE, *Photographer*
MAUD H. PURDY, *Artist*

ADMINISTRATIVE

DANIEL C. DOWNS, *Secretary and Accountant*
MAUDE E. VORIS, *Assistant Secretary*
NORMA STOFFEL BANTA, *Office Assistant*

MARIE-LOUISE HUBBARD, A.M., *Secretary to the Director*
GERTRUDE W. MERRILL, A.B., *Field Secretary*
FRANK STOLL, *Registrar and Custodian*

LAURA M. BREWSTER, *Stenographer*
CONSTANCE PURVES ELSON, B.A., *Stenographer*
HELEN E. BENNETT, *Stenographer*

* On leave of absence, October 1, 1937, to October 1, 1938.

BROOKLYN BOTANIC GARDEN RECORD

VOL. XXVII

JANUARY, 1938

NO. 1

DELECTUS SEMINUM, BROOKLYN 1937

LIST OF SEEDS OFFERED IN EXCHANGE

These seeds, collected during 1937, are offered to botanic gardens and to other regular correspondents; also, in limited quantities, to members of the Brooklyn Botanic Garden. They are not offered for sale.

Please note that applications for seeds must be received during January or February. Seeds are mailed early in March. No seeds are available at other times of the year.

SEEDS OF HERBACEOUS PLANTS

DICOTYLEDONES

Polygonaceae 77

Eriogonum
*Alleni

Kochia
trichophylla

Amarantaceae 79

Chenopodiaceae 78

Atriplex
hortensis
latifolia
Beta
chilensis
Chenopodium
anthelminticum
Bonus-Henricus
Botrys

Amarantus
caudatus
caudatus var. albiflorus
flavus
lividus var. polygonoides
" Molten Fire "
paniculatus var. sanguineus
paniculatus var. speciosus
retroflexus
" Sunrise "

* Collected from Wild Plants.

Celosia
 argentea var. plumosa
 Gomphrena
 globosa

Nyctaginaceae 80

Mirabilis
 uniflora

Phytolaccaceae 83

Phytolacca
 *decandra

Aizoaceae 84

Tetragonia
 expansa

Portulacaceae 85

Calandrinia
 grandiflora
 Portulaca
 grandiflora
 marginata
 pusilla
 Talinum
 patens

Basellaceae 86

Basella
 rubra
 rubra var. alba
 Boussingaultia
 baselloides

Caryophyllaceae 87

Arenaria
 caroliniana
 Dianthus
 alpestris
 arenarius
 chinensis
 chinensis var. Heddewigii
 croaticus

Lychnis
 alba
 Coronaria
 Flos-Jovis
 Viscaria

Silene
 Armeria
 caramanica
 caucasica
 japonica
 stellata

Tunica
 prolifera

Ranunculaceae 91

Actaea
 *alba
 *rubra
 Anemone
 *canadensis
 sibirica
 *virginiana
 Aquilegia
 *canadensis
 Caulophyllum
 *thalictroides
 Cimicifuga
 dahurica
 racemosa
 Clematis
 ochroleuca
 Delphinium
 grandiflorum
 Nigella
 damascena
 hispanica
 Ranunculus
 caucasicus

Papaveraceae 104

Argemone
 intermedia
 Dicentra
 eximia

* Collected from Wild Plants.

Eschscholtzia
californica
Papaver
lateritium

Capparidaceae 107

Cleome
spinosa
Gynandropsis
pentaphylla
Polanisia
graveolens
trachysperma

Crassulaceae 115

Sedum
Ellacombianum
hybridum

Rosaceae 126

Geum
*canadense
molle
Gillenia
trifoliata
Potentilla
grandiflora
Hopwoodiana
Nuttallii
rupestris
Warrensii
Sanguisorba
*canadensis

Leguminosae 128

Baptisia
australis
tinctoria
Cassia
marilandica
Dolichos
Lablab
Lespedeza
*virginica

* Collected from Wild Plants.

Tephrosia
virginiana

Geraniaceae 129

Erodium
cicutarium
Geranium
albiflorum
pratense
pratense forma album

Linaceae 132

Linum
africanum
campanulatum
corymbiferum
perenne

Euphorbiaceae 147

Euphorbia
Darlingtonii
marginata

Balsaminaceae 168

Impatiens
Balfouri
Balsamina
*biflora
firmula

Malvaceae 175

Altheaea
taurinensis
Gossypium
herbaceum
Hibiscus
militaris
Moscheutos
Moscheutos Hybrids
Kitaibelia
vitifolia

Cistaceae 193

Helianthemum
Chamaecistus
guttatum

Violaceae 198

Viola
tricolor

Loasaceae 206

Blumenbachia
Hieronymi
insignis

Datiscaceae 207

Datisca
cannabina

Begoniaceae 208

Begonia
luminosa

Lythraceae 216

Cuphea
petiolata
Lythrum
*Salicaria

Melastomaceae 223

Rhexia
*virginica

Onagraceae 224

Epilobium
angustifolium
Godetia
viminea
Oenothera
Drummondii
fruticosa
speciosa

Umbelliferae 228

Archangelica
atropurpurea
Bupleurum
fruticosum

* Collected from Wild Plants.

Eryngium
aquaticum
Oliverianum
serbicum
Foeniculum
vulgare
Pimpinella
aromaticum
Zizia
aurea
cordata

Primulaceae 237

Anagallis
arvensis
arvensis var. caerulea
Dodecatheon
Meadia
Lysimachia
clethroides
Primula
japonica
Steironema
*ciliatum
Trientalis
*americana

Plumbaginaceae 238

Goniolimon
serbicum
Limonium
binervosum
elatum
latifolium
lychnidifolium
speciosum
vulgare

Gentianaceae 246

Nymphoides
peltatum

Apocynaceae 247

Amsonia
Tabernaemontana

Rhazya
orientalis

Asclepiadaceae 248

Asclepias
Hallii
*incarnata
tuberosa
Vincetoxicum
medium

Polemoniaceae 250

Phlox
Drummondii
Drummondii var. gigantea

Borraginaceae 252

Cerintho
minor
Cynoglossum
Rochelia

Verbenaceae 253

Verbena
bonariensis
venosa

Labiatae 254

Monarda
*fistulosa
lasiodonta
*punctata
stricta
Ocimum
Basilicum
Perilla
frutescens var. nankinensis
Salvia
glutinosa
nemerosa
Sclarea
splendens
Satureja
Acinos

* Collected from Wild Plants.

Scutellaria
angustifolia
canescens

Nolanaceae 255

Nolana
prostrata

Solanaceae 256

Nicotiana
rustica
Sanderac
Tabacum
Physalis
Alkekengi
Solanum
Dulcamara
sisymbriifolium

Scrophulariaceae 257

Antirrhinum
majus
Linaria
macedonica
Penstemon
barbatus
barbatus var. Torreyi
diffusus
*digitalis
diphyllus
*hirsutus
Rhinanthus
*Crista-galli
Scrophularia
aestivalis
luridiflora
marilandica
nodosa
pyrenaica
Verbascum
songaricum
Thapsus

Veronica
 caucasica
 latifolia
 longifolia subsessilis
 maritima
 Waldsteinii

Acanthaceae 266

Acanthus
 longifolius
 mollis

Phrymaceae 268

Phryma
 leptostachya

Caprifoliaceae 271

Sambucus
 Ebulus

Dipsacaceae 274

Cephalaria
 ambrosioides
 graeca
 Scabiosa
 atropurpurea

Campanulaceae 276

Campanula
 betonicaefolia
 latifolia var. eriocarpa
 macrantha
 Morettiana
 Downingia
 elegans
 Lobelia
 *cardinalis
 Cliffortiana
 Erinus
 tenuior

Compositae 280

Ageratum
 mexicanum

Anthemis
 tinctoria
 Arctotis
 stoechadifolia
 Aster
 gracilis
 novae-angliae
 novae-angliae var. roseus
 patens
 Brachycome
 iberidifolia
 Buphthalmum
 speciosum
 Calendula
 officinalis
 Carduus
 Kernerii
 Centaurea
 cyanus
 macrocephala
 montana
 spinulosa
 Chrysanthemum
 Myconis
 Chrysopsis
 *falcata
 Cichorium
 Endivia
 Cirsium
 Diacantha
 Coreopsis
 Atkinsoniana
 grandiflora
 lanceolata
 palmata
 Cosmos
 “ Early Orange Flare ”
 Cousinia
 microcarpa
 Eupatorium
 coelestinum
 hyssopifolium
 *perfoliatum
 *pubescens
 *purpureum

* Collected from Wild Plants.

Gaillardia	Onopordon
aristata picta	Acanthium
Helenium	Rudbeckia
autumnale	laciniata
Helianthus	Senecio
*decapetalus	Biebersteinii
Heliopsis	orientalis
helianthoides var. Pitcher-	Sericocarpus
iana	*linifolius
scabra var. zinnaeflora	Silphium
Inula	perfoliatum
grandiflora	Solidago
Helenium	canadensis
magnifica	Sonchus
salicina	oleraceus
Liatris	Tagetes
pycnostachya	patula var.
scariosa	Vernonia
Matricaria	noveboracensis
inodora	Zinnia
Mikania	Haagenana
*scandens	verticillata

MONOCOTYLEDONES

Typhaceae 308

Typha
*angustifolia
*latifolia

Gramineae 319

Andropogon
*scoparius
Uniola
latifolia

Araceae 323

Arisaema
*triphyllum

Liliaceae 338

Allium
fistulosum
Schoenoprasum var. sibiricum

Alstroemeria
aurantiaca var. lutea
Anthericum
Liliago
Clintonia
*borealis
Kniphofia
uvaria
Lilium
regale
Medeola
*virginiana
Polygonatum
biflorum
Zygadenus
elegans

Iridaceae 344

Iris
*setosa var. canadensis
*versicolor

* Collected from Wild Plants.

SEEDS COLLECTED AT BELGRADE LAKES, MAINE

<i>Aralia hispida</i>	<i>Medeola virginiana</i>
<i>Aralia nudicaulis</i>	<i>Mentha arvensis canadensis</i>
<i>Arisaema triphyllum</i>	<i>Nemopanthus mucronata</i>
<i>Clintonia borealis</i>	<i>Pyrus melanocarpa</i>
<i>Coptis trifolia</i>	<i>Rosa carolina</i>
<i>Cornus canadensis</i>	<i>Sambucus canadensis</i>
<i>Crataegus</i> sp.	<i>Thalictrum polygamum</i>
<i>Cypripedium acaule</i>	<i>Trillium undulatum</i>
<i>Epilobium angustifolium</i>	<i>Trientalis americana</i>
<i>Gaultheria procumbens</i>	<i>Vaccinium canadense</i>
<i>Gaylussacia baccata</i>	<i>Vaccinium corymbosum</i>
<i>Hypericum punctatum</i>	<i>Vaccinium pennsylvanicum</i>
<i>Ilex verticillata</i>	<i>Viburnum acerifolium</i>
<i>Iris prismatica</i>	<i>Viburnum alnifolium</i>
<i>Iris versicolor</i>	<i>Viburnum cassinoides</i>
<i>Lyonia ligustrina</i>	<i>Viburnum dentatum</i>
<i>Maianthemum canadense</i>	

Address requests for seeds before March 1, 1938 to

SEED EXCHANGE,
Brooklyn Botanic Garden,
1000 Washington Avenue,
Brooklyn, N. Y.,
U. S. A.

THE INTERNATIONAL SEED EXCHANGE

Members of the Garden may be interested in the following information.

The interchange of seeds between botanic gardens goes back many years. In our library is an autograph letter from the great Linnaeus to his friend, Duchesne, dated 1767, asking for seeds of certain plants, and offering others in exchange.

In our own country, the systematic exchange of seeds with other nations dates from the very beginning of our national existence. After Thomas Jefferson returned to America from France, where he had represented the United States of America, he began sending his French friends seeds of native plants, receiving from them seeds of French plants in return. This interchange continued for some twenty-three years. "By his desire, our consuls

in every foreign port, collected and transmitted to him seeds of the finest vegetables and fruits that were grown in the countries where they resided. These he would distribute among the market-gardeners in the city (Washington) . . . not sending them, but giving them himself, and accompanying his gifts with the information necessary for their proper culture and management, and afterwards occasionally calling to watch the progress of their growth. This excited the emulation of our horticulturists, and was the means of greatly improving our markets."

For more than twenty years (since 1914) the Brooklyn Botanic Garden has published lists of seeds offered in exchange to other botanic gardens of the world; and also, on request, to members of the Garden. This interchange of seeds among the world's botanic gardens has been called the "International Seed Exchange," which, however, is merely a convenient name for this particular activity, since no formal organization with such a title exists. The list sent by our Garden is checked, and returned by the institutions receiving it. Similar lists offered by other botanic gardens are received annually by our Garden. The names of desired sorts are checked, and the list mailed back to the garden concerned, which then sends us seeds. By this exchange many American plants, raised from seeds supplied by Brooklyn Botanic Garden, have enriched the collections of other botanic gardens in many countries from Siberia to South Africa. Similarly, many valuable exotic plants, now growing in the conservatories and in the outdoor plantations of our Garden, have been acquired in the past.

The seeds are collected by the Garden from various sources: from plants growing in the Garden, from wild plants of nearby regions, and through the cooperation of collectors in other parts of the United States.

Distribution has exceeded 5000 packets of seeds in one year; more requests are received than can be filled. Seeds are supplied to gardens in about forty foreign countries.

The seeds are not for sale. Though primarily an interchange for scientific purposes, they are offered, in limited quantities, to members of the Brooklyn Botanic Garden, after the foreign correspondents have been supplied.

The Brooklyn Institute of Arts and Sciences

OFFICERS OF THE BOARD OF TRUSTEES

PRESIDENT

EDWARD C. BLUM

FIRST VICE-PRESIDENT

WALTER H. CRITTENDEN

SECOND VICE-PRESIDENT

ADRIAN VAN SINDEREN

THIRD VICE-PRESIDENT

SUMNER FORD

TREASURER

EDWIN P. MAYNARD

SECRETARY

JOHN H. DENBIGH

BOTANIC GARDEN GOVERNING COMMITTEE

MISS HILDA LOINES, *Chairman*

PHILIP A. BENSON

WALTER HAMMITT

EDWARD C. BLUM, *Ex officio*

WILLIAM T. HUNTER

MRS. WILLIAM H. CARY

DAVID H. LANMAN

WALTER H. CRITTENDEN

EDWIN P. MAYNARD

MRS. LEWIS W. FRANCIS

ALFRED E. MUDGE

EX OFFICIO MEMBERS OF THE BOARD

THE FOLLOWING OFFICIALS OF THE CITY OF NEW YORK

THE MAYOR

THE COMPTROLLER

THE COMMISSIONER OF PARKS

GENERAL INFORMATION

MEMBERSHIP.—All persons who are interested in the objects and maintenance of the Brooklyn Botanic Garden are eligible to membership. Members enjoy special privileges. Annual Membership, \$10 yearly; Sustaining Membership, \$25 yearly; Life Membership, \$500. Full information concerning membership may be had by addressing *The Director, Brooklyn Botanic Garden, 1000 Washington Avenue, Brooklyn, N. Y.* Telephone, Prospect 9-6173.

THE BOTANIC GARDEN is open free to the public daily from 8 a.m. until dusk; on Sundays and Holidays it is open at 10 a.m.

ENTRANCES.—On Flatbush Avenue, near Empire Boulevard and near Mt. Prospect Reservoir; on Washington Avenue, south of Eastern Parkway and near Empire Boulevard; on Eastern Parkway, west of the Museum Building.

The street entrance to the Laboratory Building is at 1000 Washington Avenue, opposite Crown Street.

To ASSIST MEMBERS and others in studying the collections the services of a docent may be obtained. This service is free of charge to *members of the Botanic Garden*; to others there is a charge of 50 cents per person. Arrangements must be made by application to the Curator of Public Instruction at least one day in advance. No parties of less than six adults will be conducted.

To REACH THE GARDEN take Broadway (B.M.T.) Subway to Prospect Park Station; Interborough Subway to Eastern Parkway-Brooklyn Museum Station; Flatbush Avenue trolley to Empire Boulevard; Franklin Avenue, Lorimer Street, or Tompkins Avenue trolley to Washington Avenue; St. John's Place trolley to Sterling Place and Washington Avenue; Union Street or Vanderbilt Avenue trolley to Prospect Park Plaza and Union Street. BY AUTOMOBILE from points on Long Island take Eastern Parkway west and turn left at Washington Avenue; from Manhattan, take Manhattan Bridge, follow Flatbush Avenue Extension and Flatbush Avenue to Eastern Parkway, turn left following Parkway to Washington Avenue; then turn right.

BROOKLYN BOTANIC GARDEN PUBLICATIONS

RECORD. Established, January, 1912. An administrative periodical issued quarterly (1912-1928); bimonthly (1929-1932); quarterly (1933-). Contains, among other things, the *Annual Report* of the director and heads of departments, special reports, announcements of courses of instruction, seed list, guides, miscellaneous papers, and notes concerning Garden progress and events. Free to members of the Garden. To others \$1.00 a year. Circulates in 59 countries.

MEMOIRS. Established, July, 1918. Published irregularly. Circulates in 47 countries.

Volume I. *Dedication Papers*: comprising 33 scientific papers presented at the dedication of the laboratory building and plant houses, April 19-21, 1917. 521 pages. Price \$3.50, plus postage.

Volume II. The vegetation of Long Island. Part I, The vegetation of Montauk: A study of grassland and forest. By Norman Taylor, June 11, 1923. 108 pages. Price \$1.00, plus postage.

Volume III. Vegetation of Mount Desert Island, Maine, and its environment. By Barrington Moore and Norman Taylor, June 10, 1927. 151 pages. Price \$1.60.

CONTRIBUTIONS. Established, April 1, 1911. Papers originally published in periodicals, reissued as "separates" without change of paging, and numbered consecutively. Twenty-five numbers constitute one volume. Price 25 cents each, \$5.00 a volume. Circulates in 34 countries.

No. 74. *The effects of radium rays on plants: Résumé of the more important papers from 1901 to 1932.* 27 pages. 1936.

No. 75. *Inheritance of resistance to the loose and covered kernel smuts of Sorghum: I. Dwarf Yellow Milo hybrids.* 20 pages. 1937.

No. 76. *Inheritance of resistance to the loose and covered kernel smuts of Sorghum: II. Feterita hybrids.* 22 pages. 1937.

No. 77. *Monographic studies in the Genus Eleocharis. IV.* 63 pages. 1937.

No. 78. *Experiments on latent infection of resistant varieties by the loose and covered smut of oats.* 11 pages. 1937.

LEAFLETS. Established, April 10, 1913. Published weekly or biweekly during April, May, June, September, and October. The purpose of the *Leaflets* is primarily to give announcements concerning flowering and other plant activities to be seen in the Garden near the date of issue, and to give popular, elementary information about plant life for teachers and others. Free to members of the Garden. To others, fifty cents a series. Single numbers 5 cents each. Circulates in 28 countries. Temporarily discontinued, 1936-37.

GUIDES to the collections, buildings, and grounds. Price based upon cost of publication. Issued as numbers of the **RECORD**; see above.

Guide No. 5. The Rock Garden. 28 illustrations. Price, 35 cents. By mail, 40 cents.

Guide No. 6. Japanese potted trees (Hachinoki). 11 illustrations. Price, 35 cents. By mail, 40 cents.

Guide No. 7. The story of our boulders: Glacial geology of the Brooklyn Botanic Garden. 22 illustrations. Price, 35 cents. By mail, 40 cents.

Guide No. 8. The story of fossil plants. 8 illustrations. Price, 35 cents. By mail, 40 cents.

SEED LIST. (*Delectus Seminum*) Established, December, 1914. Since 1925 issued each year in the January number of the **RECORD**. Circulation includes 160 botanic gardens and institutions located in 40 countries.

ECOLOGY. Established, January, 1920. Published quarterly in coöperation with the **ECOLOGICAL SOCIETY OF AMERICA**. Subscription, \$4.00 a year. Circulates in 48 countries.

GENETICS. Established, January, 1916. Bimonthly. Subscription, \$6.00 a year. Circulates in 37 countries.

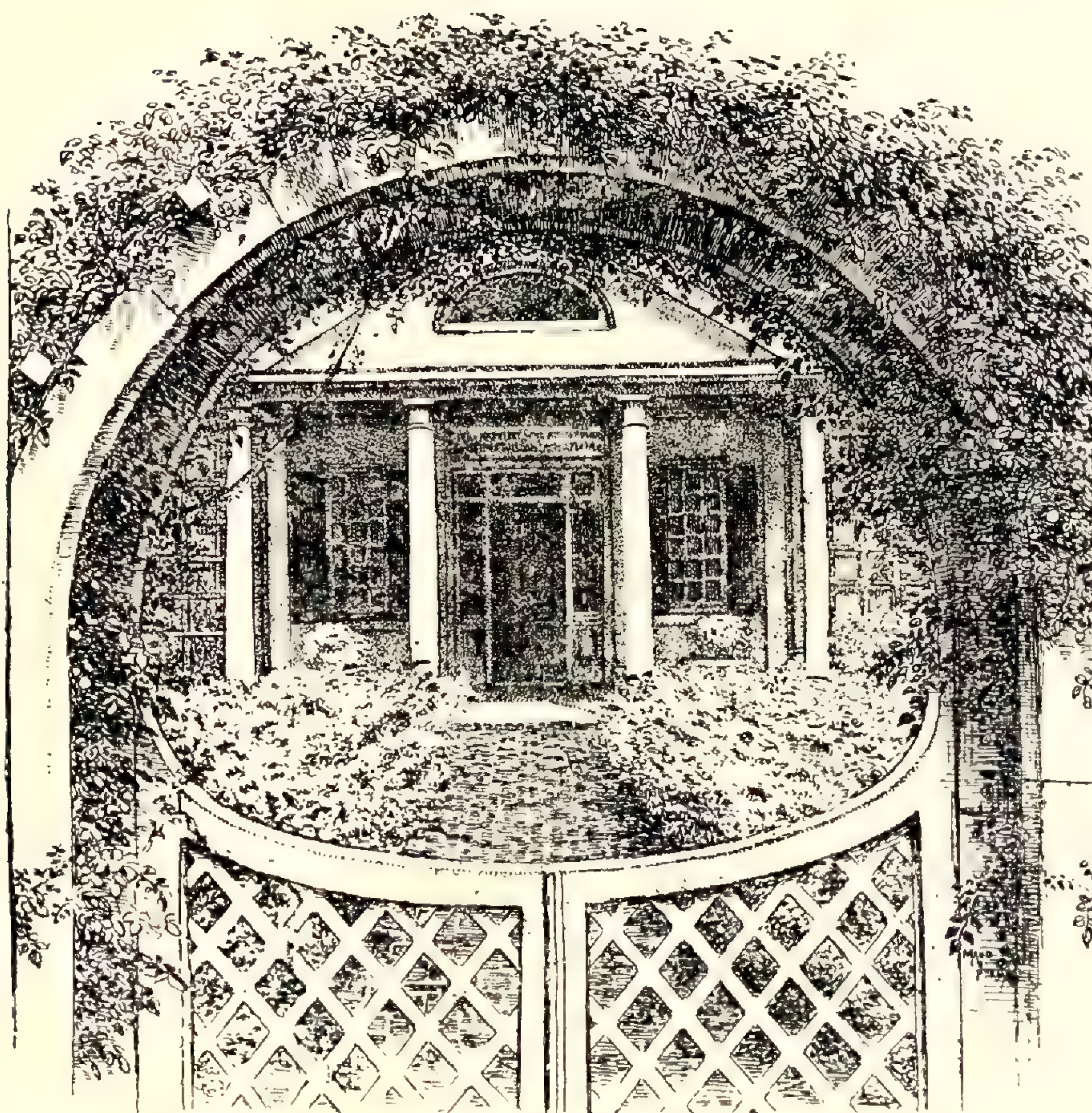
BROOKLYN BOTANIC GARDEN RECORD

VOL. XXVII

APRIL, 1938

NO. 2

CONTAINING THE
TWENTY-SEVENTH ANNUAL REPORT
OF THE
BROOKLYN BOTANIC GARDEN
1937



PUBLISHED QUARTERLY
AT PRINCE AND LEMON STREETS, LANCASTER, PA.
BY THE BROOKLYN INSTITUTE OF ARTS AND SCIENCES
BROOKLYN, N. Y.

Entered as second-class matter in the post-office at Lancaster, Pa., under act of August 24, 1912

BROOKLYN BOTANIC GARDEN

Scientific, Educational, and Administrative Officers

SCIENTIFIC AND EDUCATIONAL

The Staff

C. STUART GAGER, Ph.D., Sc.D., Pd.D., *Director*
MONTAGUE FREE, Certificate, Royal Botanic Gardens, Kew, *Horticulturist*
ARTHUR HARMOUNT GRAVES, Ph.D., *Curator of Public Instruction*
ALFRED GUNDERSEN, Docteur de l'Université (Paris), *Curator of Plants*
WILLIAM E. JORDAN, B.S., *Librarian*
GEORGE M. REED, Ph.D., *Curator of Plant Pathology*
ELLEN EDDY SHAW, B.S., *Curator of Elementary Instruction*
HENRY K. SVENSON, Ph.D., *Curator of the Herbarium*
MARGARET M. DORWARD, A.B., *Assistant Curator of
Elementary Instruction*

Other Officers

MARY AVERILL, *Honorary Curator of Japanese Gardening and Floral Art*
HAROLD A. CAPARN, *Consulting Landscape Architect*

RALPH CURTISS BENEDICT, Ph.D., *Resident Investigator (Ferns)*
RALPH H. CHENEY, Sc.D., *Resident Investigator (Economic Plants)*

EMILIE PERPALL, CHICHESTER, *Library Assistant*
CHARLES F. DONEY, M.S., *Assistant in Woody Plants*
WILLIAM H. DURKIN, *Curatorial Assistant*
ELSIE TWEMLOW HAMMOND, M.A., *Instructor*
D. ELIZABETH MARCY, A.M., Ph.D., *Research Assistant*
FRANCES M. MINER,* A.B., *Instructor*
MARGARET BURDICK PUTZ, *Curatorial Assistant*
HESTER M. RUSK, A.M., *Instructor*
MARGERY H. UDELL, *Curatorial Assistant*
L. GORDON UTTER, M.S., *Research Assistant*
HILDA VILKOMERSON, A.B., *Curatorial Assistant*

LOUIS BUHLE, *Photographer*
MAUD H. PURDY, *Artist*

ADMINISTRATIVE

DANIEL C. DOWNS, *Secretary and Accountant*
MAUDE E. VORIS, *Assistant Secretary*
NORMA STOFFEL BANTA, *Office Assistant*

MARIE-LOUISE HUBBARD, A.M., *Secretary to the Director*
GERTRUDE W. MERRILL, A.B., *Field Secretary*
FRANK STOLL, *Registrar and Custodian*

LAURA M. BREWSTER, *Stenographer*
CONSTANCE PURVES ELSON, B.A., *Stenographer*
HELEN E. BENNETT, *Stenographer*

* On leave of absence, October 1, 1937, to October 1, 1938.

THE BOTANIC GARDEN AND THE CITY

THE BROOKLYN BOTANIC GARDEN, established in 1910, is a Department of the Brooklyn Institute of Arts and Sciences. It is supported in part by municipal appropriations, and in part by private funds, including income from endowment, membership dues, and special contributions. Its articulation with the City is through the Department of Parks.

The City owns the land devoted to Garden purposes, builds, lights, and heats the buildings, and keeps them in repair, and includes in its annual tax budget an appropriation for other items of maintenance. One third of the cost of the present buildings (about \$300,000) and of other permanent improvements (about \$253,000) has been met from private funds.

Appointments to all positions are made by the director of the Garden, with the approval of the Botanic Garden Governing Committee, and all authorized expenditures for maintenance are made in the name of the private organization, from funds advanced by the Institute, which, in turn, is reimbursed from time to time by the City, within the limits, and according to the terms of the annual Tax Budget appropriation.

All plants have been purchased with private funds since the Garden was established. In addition to this, it has been the practice of the Garden, from its beginning, to purchase all books for the library, all specimens for the herbarium, all lantern slides and photographic material, and numerous other items, and to pay certain salaries, with private funds.

The needs of the Garden for private funds for all purposes, are more than twice as great as the present income from endowment, membership dues, and special contributions. The director of the Garden will be glad to give full information as to possible uses of such funds to any who may be interested.

INFORMATION CONCERNING MEMBERSHIP

The Brooklyn Institute of Arts and Sciences is organized in three main departments: 1. The Department of Education. 2. The Museums. 3. The Botanic Garden.

Any of the following seven classes of membership may be taken out through the Botanic Garden:

1. Annual member	\$ 10
2. Sustaining member	25
3. Life member	500
4. Permanent member	2,500
5. Donor	10,000
6. Patron	25,000
7. Benefactor	100,000

Sustaining members are annual members with full privileges in Departments one to three. Membership in classes two to seven carries full privileges in Departments one to three.

In addition to opportunities afforded to members of the Botanic Garden for public service through cooperating in its development, and helping to further its aims to advance and diffuse a knowledge and love of plants, to help preserve our native wild flowers, and to afford additional and much needed educational advantages in Brooklyn and Greater New York, members may also enjoy the privileges indicated on the following page.

Further information concerning membership may be had by addressing The Director, Brooklyn Botanic Garden, Brooklyn, N. Y., or by personal conference by appointment. Telephone, Prospect 9-6173.

PRIVILEGES OF MEMBERSHIP

1. Free admission to the buildings and grounds at all times.
2. Cards of admission for self and friends to all exhibitions and openings preceding the admission of the general public, and to receptions.
3. Services of docent (by appointment), for self and party (of not less than six), when visiting the Garden.
4. Admission of member and one guest to field trips and other scientific meetings under Garden auspices, at the Garden or elsewhere.
5. Free tuition in most courses of instruction; in other courses a liberal discount from the fee charged to non-members.
6. Invitations for self and friends to spring and fall "Flower Days," and to the Annual Spring Inspection.
7. Copies of Garden publications, as follows:
 - a. RECORD (including the ANNUAL REPORT).
 - b. GUIDES (to the Plantations and Collections).
 - c. LEAFLETS (of popular information).
 - d. CONTRIBUTIONS (on request. Technical papers).
8. Announcement Cards (Post Card Bulletins) concerning plants in flower and other items of interest.
9. Privileges of the Library and of the Herbarium.
10. Expert advice on the choice and care of ornamental trees, shrubs, and herbaceous plants, indoors and out; on planting the home grounds; the care of lawns; and the treatment of plants affected by insect and fungus pests.
11. Determination of botanical specimens.
12. Participation in the periodical distribution of surplus plant material and seeds, in accordance with special announcements sent to members from time to time.
13. Membership privileges in other botanic gardens and museums outside of Greater New York, when visiting other cities, and on presentation of membership card in Brooklyn Botanic Garden. (See the following page.)

FORMS OF BEQUEST TO THE BROOKLYN BOTANIC GARDEN

Form of Bequest for General Purposes

I hereby give, devise, and bequeath to The Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y., the sum of.....Dollars, the income from which said sum to be used for the educational and scientific work of the Brooklyn Botanic Garden.

Form of Bequest for a Curatorship

I hereby give, devise, and bequeath to The Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y., the sum of.....Dollars, as an endowment for a curatorship in the Brooklyn Botanic Garden, the income from which sum to be used each year towards the payment of the salary of a curator in said Botanic Garden, to be known as the (here may be inserted the name of the donor or other person) curatorship.

Form of Bequest for a Fellowship

I hereby give, devise, and bequeath to The Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y., the sum of.....Dollars, the income from which sum to be used in the payment of a fellowship for advanced botanical investigation in the Brooklyn Botanic Garden, to be known as thefellowship.

Form of Bequest for other particular purposes designated by the testator

I hereby give, devise, and bequeath to The Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y., the sum of.....Dollars, to be used (or the income from which to be used) for the Brooklyn Botanic Garden *
.....
.....

* The following additional purposes are suggested for which endowment is needed:

- 1. Botanical research.
- 2. Publishing the results of botanical investigations.
- 3. Popular botanical publication.
- 4. The endowment of a lectureship, or a lecture course.
- 5. Botanical illustrations for publications and lectures.
- 6. The purchase and collecting of plants.
- 7. The beautifying of the grounds.
- 8. The purchase of publications for the library.
- 9. Extending and enriching our work of public education.
- 10. The establishing of prizes to be awarded by the Brooklyn Botanic Garden for botanical research, or for superior excellence of botanical work in the High Schools of the City of New York.



FIG. 1. Portion of Wall Garden, June 16. The entire length is about 385 feet. Initial planting in 1935 with some 2000 plants in about 30 species and varieties. (9422)

BROOKLYN BOTANIC GARDEN RECORD

VOL. XXVII

APRIL, 1938

NO. 2

TWENTY-SEVENTH ANNUAL REPORT OF THE BROOKLYN BOTANIC GARDEN 1937

REPORT OF THE DIRECTOR

TO THE BOTANIC GARDEN GOVERNING COMMITTEE:

I have the honor to present herewith the Twenty-Seventh Annual Report of the Brooklyn Botanic Garden for the calendar year 1937.

This year, like others, has been one of both losses and gains. The losses, in personnel and income, have been serious; the gains have been substantial and encouraging.

Frances E. White.—The Garden sustained its most serious loss on March 11 in the passing of Miss Frances E. White, a member of the Garden in the class of Benefactors, and one of the three “founders” of the Garden.

In June, 1905, her brother, Alfred T. White, presented a letter to the Board of Trustees of the Brooklyn Institute of Arts and Sciences stating that two anonymous donors would present to the Board the sum of Fifty Thousand Dollars for the purpose of establishing a botanic garden in Brooklyn. This was the amount which the Board of Estimate and Apportionment of the City required the Trustees to provide as a condition for the City to assign the present site to be administered by them as a botanic garden. Miss White was one of the anonymous donors, con-

tributing one half the required amount, which became the initial "Endowment Fund" of the Garden.

But the gift was more than a sum of money. There went with it a personal and understanding interest which was sustained and deepened through all the more than twenty-six years of the Garden's history, and has been one of our most precious possessions. In my address at the twenty-fifth anniversary of the Garden I stated that what such an institution most needs is friends who are not merely interested in it, but who are enthusiastic about it. It was such a friend that the Garden had in the person of Miss White.

When the Citizens Endowment Fund of \$250,000 was raised as a condition for receiving a like amount from Mr. John D. Rockefeller, Jr., Miss White was one of the largest contributors. When one of our important research projects, initiated by Mr. Alfred T. White, was in jeopardy from threatened loss of income Miss White was one of the group of four persons who sensed the basic importance of research for such an institution as this, and took the necessary steps to insure its continuation.

Miss White was born in 1847 at 163 West Street, Brooklyn, but she had resided continuously at the family home, 2 Pierrepont Place, since its construction in 1857. In addition to the Brooklyn Botanic Garden, Miss White was actively interested in the Brooklyn Institute of Arts and Sciences (of which the Garden is a Department), the Graham Home for Old Ladies (of which she was president for many years), the Brooklyn Visiting Nurse Association, the Children's Aid Society, the Society for the Prevention of Cruelty to Children, the Brooklyn Bureau of Charities, the Brooklyn Hospital (where she died), and the Church of the Saviour (Unitarian), of which she was an active member.

Her contributions were the expression of a generous and philanthropic spirit, actively interested in whatever promotes human well-being and happiness, and in every movement for the cultural and civic welfare of Brooklyn, most of whose citizens (including even the beneficiaries of her largesse) were wholly unaware of the reach and depth of her benefactions, so quietly and anonymously were they given. Of herself and her resources she gave from a sense of stewardship and for the gratification of helping to make the world a better place in which to live. Her

passing is an irreparable loss, not only to the Botanic Garden but to the entire City.

THE GARDEN AND THE PUBLIC

Attendance.—The appended report of the curator of public instruction records a total registered attendance for the year of 1,691,835, the largest monthly attendance being 346,871 for May, and largest week-end attendances approximately 46,000 from Saturday noon to Sunday closing, May 1–2, and approximately 48,000 the week-end following. The annual attendance was 124,531 greater than that of 1936, and more than 678,500 greater than ten years ago. These figures mean not only added interest on the part of the public, but greater usefulness of the Garden, and increased wear and tear on the walks and lawns, and otherwise. They also mean the necessity for additional laborers, and guards, and make more urgent the need for an attendant at each entrance gate.

Botanic Garden versus Park.—In previous reports I have called attention to the difference in the purposes to be served by a botanic garden and a park. A park is a place to be used primarily for recreation. In a park, for example, games may be played, lunches may be eaten; people may recline on the lawns within certain limitations. All of these things, desirable in their proper place, would tend to defeat the primary purpose of the plantations of a botanic garden, which are intended to be essentially an out-doors museum of plant life, and must be administered as such. The distinction is not generally understood, and that explains in part the difficulty in handling the multitudes who visit the Garden. So many of them do not realize that they are in a garden and not in a park, and, therefore, cannot do certain things that are rightly permissible in a park.

The problem here involved is an old one. Almost exactly one hundred years ago (in 1835) Dr. Daubeney, director of the botanic garden of Oxford University, issued a code of “Regulations of the Botanic Garden.” Admittance at the “principal entrance” was to be obtained only “on ringing the bell attached to the gateway.” (The writer has encountered such a regulation, still in force, at some of the botanic gardens in Europe.) The third regulation at Oxford read as follows:

“General orders have been given to exclude Nursery-maids and Children from the Premises, but every facility will be afforded for the admission of persons to whom the garden may seem likely to be a source of interest or improvement.”

Such a regulation has its advantages in more ways than one, and from time to time we receive letters from persons who frequent this Garden asking if such a regulation could not be enforced here.

The need of Suitable Entrance Gates has been stressed in previous reports, and attention has been called to the fact that, more than 25 years after it was first opened to the public, the Garden has only one gate that is more than an opening through the fence. A gate at the Eastern Parkway entrance and at the north and south Washington Avenue entrances are specially needed for the convenience of the public as well as of the Garden. On November 18, 1936, the City was requested to include in its Capital Outlay Budget for 1937 the sum of \$21,366 (\$10,050 for the north gate; \$11,316 for the south gate) to provide for the two Washington Avenue gates (*City Record*, Dec. 15, 1936), but the request was not granted. On November 27, 1937, the Board of Estimate and Apportionment was requested to include in its Capital Outlay Budget for 1938 an appropriation of \$69,000 for the construction of a gate or portal at the Eastern Parkway entrance. This gate would extend across the entire Eastern Parkway frontage of some 260 feet, and would include two rooms for public convenience, the storage of garden implements, the vending of guide books and souvenir postcards, and other purposes. It is greatly needed in order that we may properly service the public at this entrance.

The importance of having at our Eastern Parkway frontage a dignified structure, of architectural value, harmonizing with the beautiful Museum building on the east, and indicating the entrance to an institution, can hardly be over-emphasized. As stated above, a botanic garden is really an outdoors museum; a beautiful structure at the main entrance, aside from the utilitarian needs which it would supply, would serve to designate an educational institution and would add to the architectural assets of the City. City parks and “zoos” commonly have beautiful

and dignified structures at their entrances; so do many foreign botanic gardens; so should the Brooklyn Botanic Garden.

Free Admission.—In response to letters soliciting contributions for the work of the Garden we received in 1937 a number of replies suggesting that admission fees should be charged, at least on certain days if not daily. There is much to be said in favor of such a plan. Some of the semi-public museums of the City and the Zoological Park have two pay days a week. The plan would exclude practically all persons who wish merely to visit a park, and many who would enter either a park or a garden for asocial or otherwise improper purposes. It would be appreciated by many. But it would greatly reduce the attendance, and it is unlikely that any “nominal” admission fee would do more than yield the amount required to collect it and do the necessary accounting. However, our “Agreement” with the City requires us to keep the Garden open to the public free every day in the year, and so no fee could be charged unless the “Agreement” were amended to provide for it.

The People and the Public.—The English poet, Wordsworth, once wrote to Sir George Beaumont that “No poem of mine will ever be popular. . . . The *People* would love the Poem of Peter Bell, but the *Public* (a very different thing) will never love it.” The distinction is subtle but very real. On any day of large attendance one may see “the People” enjoying the Garden in a manner highly gratifying to us, while at the same time “the Public” is here and there misusing it. Our dual and difficult problem is to protect the Garden from “the Public” so that it may be enjoyed by “the People” in harmony with the aims for which it was established.

THE PLANTATIONS

The plantations—the “Gardens within a Garden”—become more beautiful each year and draw an ever-increasing number of visitors. Since they have not yet become merely a maintenance project, but are still in process of development, they also require more attention each year. The trees and shrubs increase in size; the herbaceous plantings need replenishing and revising; old labels need renewing as well as new ones to be made; insect and fungus pests require more and more attention, especially when

new pests like the Japanese beetle and the Dutch Elm-disease are introduced; new features, such as the Medicinal and Culinary Herb Garden, the Wall Garden, the Rose Arc, and others demand additional work from gardeners and laborers. Since the World War the area under intensive cultivation has increased about forty per cent and yet, except for the fluctuating and otherwise inadequate help from WPA labor, the number of gardeners and laborers has remained substantially the same—actually one man less, as follows: 1918, three foremen, 21 gardeners and laborers; 1937, three foremen, 20 gardeners and laborers. The number of WPA men has gradually been diminished at the very time when the need for them was increasing.

Guards at the Gates.—It was specially unfortunate that the WPA guards at the gates have been discontinued. They were removed in the fall for the stated reason that such work is a “budgetary responsibility” (matter of routine maintenance), and it is the stated policy of the WPA not to assign workers for such positions. It is quite as important to have guards at our entrance gates as to have them at the entrance to a museum building. There was a steady decrease of petty vandalism in the Garden from the time the WPA guards were first assigned until their removal. Already there are signs of the return of the former conditions. A man is needed continuously at each of our five entrances, not only for the reason implied above, but also to give visitors the information continually asked for; to take charge of the sale of guide books, souvenir postcards, et cetera; and to provide for such emergencies as continually occur—lost articles, lost children, persons suddenly stricken ill, the exclusion of vendors and lunches, and numerous other items. He could also be responsible for the maintenance of an area within a definite radius of the gate.

Local Flora Section.—As stated in preceding reports, this section is laid out on the basis of ecology (the relation of plants to their environment)—open woods, brook, wet meadow, sand area, glacial pool, bog (acid swamp), serpentine area, etc. For some time we have been unable to secure suitable weathered limestone rocks for the installation of “lime-loving” (or lime-tolerant) plants. In Spetember, 1936, Mrs. Hollis Webster, of Lexington, Massachusetts, a member of the Herb Society of America, who

had learned on a visit to the Garden of our need of limestone, brought the matter to the attention of Mr. and Mrs. Bernhard Hoffmann, of the Berkshire Garden Center, Stockbridge, Mass., which is in a limestone area. Mr. and Mrs. Hoffmann at once became actively interested to assist us in securing limestone rocks. After unavoidable delays, and through the persistence of Mr. Hoffmann, we received the stones on September 28. They will be placed on the low embankment in the southern end of the Local Flora Section during the winter. The invaluable service of these three friends of another state has been acknowledged with the thanks of the Governing Committee and the staff.

Moss Ravine.—Few, if any, botanic gardens have included the Bryophytes (liverworts and mosses) in their plantations, and yet these plants are of popular interest and the maintenance of such a collection is an advantage for school classes. In their appended reports Mr. Free notes the construction of the Moss Ravine on the south shore of the Lake, and Dr. Gundersen records the initial planting and labeling. A re-entrant was excavated in the northfacing bank, lined with glacial boulders, and furnished with an irrigation system to keep the surfaces of the rocks moist. The first year's experience seems to indicate that a labeled collection of true Mosses, peat-moss (*Sphagnum*), and Liverworts can be successfully maintained under the conditions here provided. The collection was a center of much public interest during the year.

Miscellaneous.—In this appended report, Mr. Free notes the installation or first planting of the Medicinal and Culinary Garden, additional planting of the Wall Garden, Rose Garden, and Rose Arc, and other gardening and maintenance operations in the plantations.

RESEARCH

Botanical research falls naturally into one of two broad categories: the study of plants in health, and the study of them in disease. Just as in human medicine the study of pathology must be based upon a knowledge of normal physiology and anatomy, so in botany the study of plant diseases rests upon a thorough knowledge of plants in health—their structure, physiological

functions, relation to their environment, and classification. Both lines of research are important, even for their own sakes and without reference to practical ends, and should be promoted by such institutions as botanic gardens. Nor should the practical ends of plant breeding, crop production, and disease control be minimized.

In an address on Research in Art Museums, delivered before the American Association of Museums in 1934, Mr. Henry W. Kent, Secretary of the Metropolitan Museum of Art, divided the obligations of a museum to provide opportunities for scholarly study into three classes: "first, those required to satisfy the needs of its staff; second, those required to satisfy the needs of the student; third, those essential to its own needs as an institution, if it is to occupy the place of an establishment for . . . education."

The importance of a program of research at the Brooklyn Botanic Garden, from these three angles so well stated by Mr. Kent, has been emphasized in various Annual Reports. The outstanding perennial need of botanic gardens, considered as educational institutions and especially as custodians of extensive and valuable collections of living plants, administered for educational ends, is more knowledge. To say that this is a public as well as an institutional need and responsibility is only to state what everyone should realize. And the necessary new knowledge is, of course, to be obtained only by research.

The annual loss from plant diseases and pests, in the United States alone, has been estimated at a billion and a half dollars. Professor Furnas, in his stimulating book, "The next hundred years," has calculated that this is at the rate of nearly \$3000 a minute. The average salary of the leading and more highly paid plant pathologists of this country is probably not more than \$5000 a year—or at the rate of one cent a minute. The American Phytopathological Society has about 800 members. The average of their salaries is, roughly, not more than \$3000. In other words, to combat an economic loss of \$3000 a minute this entire country is expending for personal service about 800 times \$3000, or \$2,400,000—less than \$5.00 a minute.

Reports on research projects for 1937 may be found on pages 36–58, following. Special attention is called to the continuing

cooperation with Columbia University, New York University, Brooklyn College, and Hunter College. Also, for the third year, with the State Institute of Applied Agriculture on Long Island, at Farmingdale, in the maintenance of the Test Garden for Iris. In his appended report (p. 41), Dr. Reed, who has charge of the Iris project, notes that we have had growing at the Farmingdale Garden during 1937 as many as 645 varieties of Iris (Japanese, 245; Siberian 50; Bearded, 350).

Nine papers embodying the results of research, including Contributions Nos. 75–79, have been published by members of the Garden personnel during 1937.

Special attention is called to the appended report of the Resident Investigator for Ferns (p. 96) of the meeting held at the Garden in February for the purpose of increasing the interest of High School teachers of biology in research and offering the cooperation of the Garden in every possible way to facilitate advance studies and research by the teachers.

PUBLIC EDUCATION

Adult Education

Science and Sciscitation.—We are all familiar, or think we are, with the word *science* and what it connotes; the word *sciscitation* is rarely used, yet both words are from the same Latin root. The latter word, or at least the thing itself, should become more common, for the word means “questioning,” and without the mental attitude of interrogation—the inner urge to seek and to find, to know and explain and understand, there could be no science. In fact, all efforts at adult education are futile unless one is dealing with adults who really want to extend their knowledge and who wish it earnestly enough to put forth active effort. A lecture may serve a useful purpose as a means of stimulating a spirit of inquiry and in giving information not readily accessible in books and periodicals, but a program of education which includes only lectures to more or less passive listeners violates the fundamental principles of teaching and learning.

The Brooklyn Botanic Garden’s educational program for adults is largely, though not exclusively, of the nature of what is now technically designated as “adult education.” Its appeal is largely to those whose formal “schooling” is over but who wish

to continue in leisure time and under guidance, to follow some intellectual interest. It ranges from flower arrangement, which is essentially an art course, to the more technical aspects of botanical science. It includes much of a strictly horticultural nature, for a botanic garden is the common meeting ground of the correlative sciences of botany and horticulture. In addition, it includes opportunity for research for candidates for advanced degrees and for those who have already obtained such degrees. The appended report of the curator of public instruction indicates a gratifying response to the opportunities offered, especially when one keeps it in mind that for most of the courses a nominal fee is asked.

During the year 94 popular and semi-popular papers and reviews by members of the Garden personnel have been published, and nearly 50 news releases have been sent to newspapers.

Elementary Education

“In my youth,” says Will Durant, “I rejected astronomy, botany, and ornithology as effeminate sciences—as dismal catalogs of names. I thought I should be able to enjoy flowers, birds, and stars as well without as with a knowledge of their names and relationships. But now I think that if I knew these lustrous forms more intimately, and could call them by their first names, I should enjoy them more, if only with the half-conscious pleasure that one derives from the presence of familiar things. So I think I should have a course in Nature running through my children’s years, ranging from a recognition of the Pleiades to the art of making a garden grow.”

This coming year (1938) will be the twenty-fifth anniversary of our educational work in teaching boys and girls “the art of making a garden grow,” and all related information within the range of their comprehension. The work has been under the able administration of Miss Shaw, who organized and developed it, blazing a new trail in the educational program of a botanic garden, and offering an essentially new type of cooperation with city schools. The attendance figures in her appended report, large as they are, do not tell a complete story. In the first place, the figures might have been much larger had attendance not been made a goal wholly secondary to solid educational results in



FIG. 2. Laboratory Plaza with Magnolias in bloom. Daffodils ("Sir Watkin.") on Boulder Hill beyond. April 17. (9425)

which the controlling conditions, here as elsewhere, are the size of the staff, laboratory and greenhouse accommodations, and the adopted plan of working intensively with small groups of fifty or less in preference to large audiences of many hundreds. In the second place, the figures do not reflect the intangible results of awakened interest, encouraged enthusiasms, character building, and in many cases the revelation to boys and girls of the vocation they prefer to follow.

THE LIBRARY

“Plants without books are useless.” So wrote Sir William Hooker, the first director of Kew, to his famous son, Sir Joseph Hooker, the second director. This reminds one, by contrast, of the famous apothegm of Louis Agassiz—“Study nature, not books.” The latter saying, of course, contains an element of sound advice; it places the emphasis in the right place. If it had been qualified or expanded it would have lost much of its educational force. Indeed Agassiz’s advice is the procedure that *must* be followed in the very infancy of a science. When Pasteur discovered bacteria there were no existing books or journals on “bacteriology.” There was no such thing as bacteriology. One *had to* study bacteria, not books. But, as a science develops, a related literature gradually arises and expands. It then becomes necessary for investigators, as well as other students, to become familiar with the existing body of knowledge and methods of procedure. To paraphrase Hooker, books (and periodical literature) then become as essential as plants. The library of a scientific institution, therefore, serves a double constituency—those who wish merely to become informed as to the nature and results of the science as a matter of general information and culture, and those who plan to explore the field beyond the frontiers of what is already known.

The Library of the Botanic Garden is open free, daily, and its use by the general public is encouraged and steadily increases. The number of users now averages more than 350 a month. During the vacation months of July and August, with unusually hot and humid weather the number of users was 445 (July, 219; August, 226). As it becomes gradually enriched it becomes a more efficient adjunct of research, not only for our own staff and

students, but also for investigators elsewhere. Those who cannot come to the Garden may be served by our system of inter-library loans. The appended report of the Librarian calls attention to the wide territory that is being served by this system, as shown by the map on page 93. It is also interesting to note that the number of periodicals currently received has now exceeded 1000.

The need of our Library for increased funds is most urgent—for the purchase of books, subscriptions to periodicals, completion of periodical files, repair of binding, new binding, catalog needs, personnel, and the numerous miscellaneous expenses of library administration and public service. The Library budget for 1937 for personal service, publications, and supplies was approximately \$10,000. To meet the present needs it should be not less than \$15,000.

THE HERBARIUM

Dr. Svenson, in his appended report, records the addition of 3,856 specimens to the herbarium by accession, exchange, collection, and gift; and the distribution of 185 specimens in exchange. More than 1500 specimens were loaned for study to seven institutions located in five states, and slightly more than 1900 specimens were borrowed from 16 institutions. We are still greatly indebted to other herbariums in the matter of exchange of specimens, and special field collecting has been done and is planned for next year to enable us to pay installments on this indebtedness.

COOPERATION

Board of Education

Our cooperation with the Elementary Public Schools and High Schools has continued as usual. Each year the number of schools served in all five Boroughs of the City tends to increase. In her appended report, Miss Shaw points out that during the year we have served 92 per cent. of the Elementary Public Schools of Brooklyn (212 schools out of a total of 228). We have also served 66 schools in Manhattan, 51 in the Bronx, 89 in Queens, and 17 in Richmond (Staten Island)—a total of 435 schools.

Of the High Schools, we have served 15 out of 16 (94%) in Brooklyn, 11 out of 12 (91.6%) in Manhattan (plus two annexes),

9 out of 10 (90%) in Queens, 4 out of 6 (66.6%) in the Bronx, and 3 out of 4 (75%) in Richmond. Also seven Junior High Schools in Brooklyn and four in the other Boroughs. The service has included seven parochial schools and eight other private schools. The above figures do not include evening high schools, nor technical high schools. Two of the latter were supplied with study material.

The numerical data of this service are given in the table on page 62, but special attention is here called to the fact that living plants and plant parts and other study material have been supplied to 3762 teachers for the instruction of more than 177,400 pupils; this does not include 1342 Petri dishes filled with sterile nutrient agar for the culture of bacteria and molds—an increase of 244 or 22% over 1936. In addition, more than 915,000 penny packets of seeds have been supplied to some 300,000 pupils for planting in school and home gardens.

Teachers brought more than 51,200 pupils to the Garden in classes for instruction, and an increased amount of time has been given to conferences with teachers concerning various aspects of their nature study work.

Work for the Blind.—This work, which has been contemplated for some time, was inaugurated on May 20, when a group of 40 blind and partially blind children came to the Botanic Garden for instruction. They represented the Blind and Sight Conservation Classes of P.S. 77, Brooklyn. Miss Michalena Carroll, of Miss Shaw's Department, who has had experience along this line, conducted the class. They studied the forms and texture of flowers by handling the different parts which had been specially prepared.

Board of Higher Education

Study material has been provided for teachers in three of the four colleges under the Board of Higher Education (College of the City of New York, Hunter College, Brooklyn College), and also to seven other colleges and universities located in the City.

Scholarship.—In April, 1935, the Garden offered to award one or two scholarships, one each in two of our courses, to students in Brooklyn College for meritorious work in their Department of Biology. This offer has been taken advantage of each year since

then. The present scholar, Mr. Lester Levine, enrolled on October 30, 1937. The scholarship was held by Mr. Philip Shapiro during the spring of 1937.

Brooklyn College Campus.—In early November Dr. Earl A. Martin, Chairman of the Building Committee of Brooklyn College, asked if we would make a comparative study of the Planting Lists for their new campus, submitted by different landscape architects. Mr. Caparn and Mr. Free have been co-operating in this, and the present indications are that our services will save Brooklyn College a considerable sum of money, and will also save them from including in their planting numerous kinds of trees and shrubs not likely to do well in that location. Mr. Caparn has been retained to prepare the landscape plans for the campus.

The Biology Alumni of Brooklyn College held two evening meetings at the Garden—on June 22, with an attendance of 65, and again on September 20, with an attendance of 52.

Department of Parks

1. *Repair of the Economic House.*—In 1936 the Board of Estimate was requested to make an appropriation to meet the estimated cost of repairing the Economic House, the largest of our conservatory range, and completed in May, 1914. This is built on filled ground, and for the second time since its construction it was found to be settling unevenly. Four steel columns were added in the late fall of 1914 to help support the superstructure. After the appropriation was granted the Park Department engineers decided that the repairs must be more extensive than was at first contemplated. We are indebted to the Park Department for the preparation of the necessary plans and specifications, for securing the additional appropriation, and for supervising the work. Bids were advertised in the *City Record* for December 19, 1936. The time allowed for full performance of the contract was 80 consecutive working days. The contract was awarded to the Balaban-Gorden Co., 1457 Broadway, Manhattan, the low bidder in the sum of \$6000. Work began on January 25 and was completed on April 26. The four steel uprights were replaced with four on each side. This work necessitated the closing of the Conservatories to the public from January 1 to about September

15. The damage and loss of plants and the replanting are reported more in detail in the appended report of the horticulturist.

2. *Street Number Sign*.—Through the Park Commissioner's office arrangements were made for the making and placing of an illuminated street number in the stone over our main entrance at No. 1000 Washington Avenue. This work was completed on June 28 by WPA men, working under supervision of the Department of Parks.

Botanical Society of America

The director served as *ex officio* member of the Council of the Botanical Society of America. At the annual meeting of the Society at Indianapolis, in December, he gave the address as retiring president, on the subject, "Pandemic Botany." At the close of the address colored lantern slides and motion pictures in color were shown illustrating the plantations and activities of the Brooklyn Botanic Garden.

Works Progress Administration

Indoor Workers

During 1937 WPA workers continued substantially the same projects as during 1936. In the Progress Report signed by the Garden December 31, 1937, the Project was identified by Official Project Number 465-97-3-69; Service or Job Number 69. The number of persons assigned to the project, as of December 31, was 32 as against 55 on December 31, 1936. The average weekly payroll for the year, met by the WPA, was \$1067.14. This is \$338.86 less than the average for 1936.

Outdoor Workers

The number of outdoor WPA men (guards, technicians, and handymen) as of January 11, 1937, was 15. During the year this force was gradually reduced, and by December 31 all these men had been removed for the stated reason that these were "budgetary" positions—that is, not a special project but work of a continuing nature that should be provided for in the regular operating budget of the institution. The guards, who were stationed at the gates, and filling an urgent need of the Garden, were all removed between October 27 and November 11.

Special Projects

DeVries Window Tablet.—When the names of botanists were chosen (in 1911) for the tablets on the frieze and under the windows of the Laboratory Building one window space was left blank in the group comprising the plant breeders, Koelreuter, Camerarius, and Mendel, and the physiologists, Ingen-Housz and Sachs. This was to provide for the name of Hugo deVries, the great Dutch plant physiologist and geneticist. The original plan provided that no name of a living botanist should be included. Professor deVries died in 1935, and the tablet bearing his name was designed and made by the WPA studio at the Brooklyn Museum, and put in place about December 15, 1937. All the spaces, under the windows and along the frieze, are now filled. It may be recalled in this connection that, in 1912, Professor deVries planted the Sweet Gum tree (*Liquidambar Styraciflua*) in the northern part of the Local Flora Section of the Garden.

Acoustic Treatment for Room 330.—When the Laboratory Building was completed, in 1917, it was found that several of the rooms were unsatisfactory acoustically. In 1935, WPA workmen placed "Acoustile" (of expanded mica) on the walls of the main auditorium. The Botanic Garden supplied the tile, obtained from the Johns Manville Company, and the latter company kindly loaned the services of one of their experts to instruct the WPA men. The result was so satisfactory that arrangements were made in 1937 to have the tile placed on the ceiling of Room 330. The WPA again supplied the foreman and workmen who began on March 22, and completed the work in about ten days. The acoustics of that room are now as satisfactory as could be desired.

Horticulture in the New York World's Fair, 1939

In December, 1936, the director, attending a lecture on the New York World's Fair, 1939, by Mr. Stephen F. Voorhees, chief designer, learned that the plans did not call for any special horticultural exhibit, or any recognition of horticulture beyond the incidental planting of the fair grounds. The matter was immediately presented to several organizations, including the Horticultural Society of New York, and the latter organization appointed a special committee to look into the matter. The

director of the Garden was made chairman of the committee, being later succeeded by Mrs. Harold I. Pratt.

Conferences were held with Mr. W. Earle Andrews, General Manager of the Fair, with the ultimate result that plans were maturing toward the end of 1937 for the assignment of suitable acreage for a horticultural exhibit commensurate with the importance of horticultural science and art in our daily lives. On July 8 Mrs. Pratt attended, by invitation, a meeting of the Botanic Garden Governing Committee in Brooklyn, and presented the importance of having horticulture suitably represented at the Fair, and outlined the tentative plans being developed, including the underwriting of guarantees for specified amounts on behalf of organizations and institutions that will cooperate by taking exhibition space. The Committee expressed itself as unanimously in favor of participation by the Botanic Garden in accordance with the tentative plan, and the matter of completing the underwriting for the Garden, and other related matters, were left with the acting chairman, Mr. Benson, with power.

Miscellaneous Cooperation

The International Flower Show was held at the Grand Central Palace, Manhattan, March 15-20. Details of our exhibit are given in the appended report of the horticulturist, Mr. Free, who planned and installed it. More than 40 clippings of newspaper notices of the exhibit were received. On the evening of the first day of the Show, Lowell Thomas, radio speaker, devoted a part of his period to our exhibit. It was referred to in the papers as one of the most educational exhibits in the Show. Both Mr. Free and Dr. Gager served on the Committee of Judges. The latter completed his sixth year as a member of the Flower Show Committee, and served for the third year as a member of the Committee of the Garden Club of America for the award of the Club's gold medal for the outstanding exhibit of the Show. Mr. Hunter, of the Botanic Garden Governing Committee, loaned us the use of a truck and driver of his firm, A. Schrader's Sons, Inc., to take the main exhibit over to the Grand Central Palace and bring it back after the Show.

Merchants Association of New York.—The director of the Garden served for the 17th year as a member, and for the 6th year

as chairman of the Committee on Plant Quarantines and their Administration.

Kingston Avenue Hospital for Contagious Diseases.—In May the Garden was asked if it could cooperate in any way with this hospital in the improvement of their grounds. This is a tax-supported hospital, and the Chairman of the Social Service Board, Miss Helen C. Wood, is an annual member of the Garden. Mr. Free conferred with Miss Wood, and we supplied them with 1800 plants for the beautifying of their grounds.

Nurses Training Classes from Four Hospitals came for instruction throughout the year. As is noted in the appended report of the curator of public instruction, 1937 marked the eleventh year of this work. It began in 1927 at the suggestion of Miss Margaret S. Belyea, director of the training school of Prospect Heights Hospital, primarily for the purpose of giving the nurses-in-training a profitable hour out of doors—something more than a mere outing. Gradually, the educational aspect assumed more and more importance, until now each class period continues for about two and one-half hours, partly outdoors in the plantations, and partly in the classroom. This was an innovation in the training of nurses. The idea spread to other hospitals until, in 1937, the fourth hospital, St. Mary's, joined with the other three—Prospect Heights, King's County, and St. John's, making a total registration of 181.

Radio Garden Club.—This cooperation continued through 1937 for the sixth year with 14 broadcasts over WOR. The fan mail now comes from 27 states, including Maine and California, and from Canada. The third largest number of letters come from California, which is exceeded only by New Jersey and New York. In addition, members of staff gave 14 broadcasts over WNYC (the Municipal Station), and one each over WMCA and WHN.

Mr. and Mrs. Suydam Cutting spent a portion of 1937 collecting plants in central Tibet. At their request, we arranged in advance to have Mrs. Cutting act as representative of the Botanic Garden. Mr. Cutting represented the American Museum of Natural History. Shipping tags were supplied from the U. S. Department of Agriculture, Bureau of Entomology and Plant Quarantine, so that Mrs. Cutting's collections for the Garden could be brought into this country on Brooklyn Botanic Garden permit. Before

the close of the year we received notice of the shipment of the plants, but they had not arrived as of December 31.

Department of Parks, Victoria, B. C.—In December we received a letter from this Department appealing to us for information as to what the best trees and shrubs would be to plant in the streets of their city, not for shade (which they state is not necessary there), but for ornament. We responded with detailed suggestions.

Garden Clubs.—Our cooperation with numerous garden clubs and other organizations is reflected, in part, by the list of 34 such organizations that have held meetings at the Garden during the year (p. 131). Other items of cooperation are also recorded in the appended reports of heads of departments.

In response to a call from the Brooklyn Edison Club, three lectures have been given before the Club at the Brooklyn Edison Building by Miss Dorward (March 9), Mr. Bishop (July 13), and Mr. Tilley (September 15).

WOMAN'S AUXILIARY

The activities of this indispensable unit of the Botanic Garden organization are summarized in the appended report of the field secretary (p. 99). Our thanks are due not only to the officers and chairmen of the committees, but also to every member.

ASSOCIATED HOSPITAL SERVICE

On May 26 Mr. R. J. Tilstra, representing the Associated Hospital Service of New York, presented the advantages of enrollment in the service in securing hospital accommodations for one's self (or for self and family according to the plan chosen) during illness. During the year 24 members of the Garden personnel have enrolled to secure the benefits of this service.

PERSONNEL

Mr. David H. Lanman, who became a member of the Board of Trustees on October 8, 1936, was appointed by President Blum, on March 19, 1937, as a member of the Botanic Garden Governing Committee.

Mr. Walter Hammitt, who became a member of the Board of Trustees on January 14, 1937, was appointed a member of the

Botanic Garden Governing Committee by President Blum on April 9, 1937.

Miss Frances E. Miner, instructor, was granted a year's leave of absence, beginning October 1, 1937, for the purpose of making a study of children's gardening for the National Recreation Association, which is considering the possibility of inaugurating children's gardens as a part of their work.

Mr. Montague Free. In March was published Mr. Free's book, "Gardening: A complete guide to garden making," 550 pages, 73 halftones and 125 line drawings. Most of the halftone figures are reproductions of photographs of views in the Brooklyn Botanic Garden made by Mr. Louis Buhle, staff photographer; all the line-cut figures are by Miss Maud Purdy, staff artist of the Garden. A review of this book in the *National Horticultural Magazine* (Washington) describes it as "the best book ever published for American gardens." On July 17 Mr. Free was elected an Honorary Member of the Men's Garden Clubs of America, Inc.

Miss Michalena Carroll, who has been temporarily employed in the Department of Elementary Instruction in art work and teaching for more than a year, was made temporary assistant to take over some of Miss Miner's duties, beginning as of October 1. Last August Miss Carroll acted as instructor at the Conference conducted at Blue Ridge, North Carolina, by the State Department of Education, and held at the Blue Ridge Graduate College, an affiliate of Yale University. Her work was similar to what she does at the Botanic Garden—teaching children how to use plant life in decorative ways, making drawings and spatter prints of plants and plant parts, and interpreting the rôle of plant life in classic pictures. She has been asked to return for a second season.

Mr. Oswald Thorsen, night engineer since November 9, 1920, resigned as of May 31, 1937.

Mr. Gosta Wernberg was appointed night engineer beginning June 1, 1937, in place of Oswald Thorsen, resigned.

MEMBERSHIP

The number of memberships representing yearly income is 639 (Annual 553, Sustaining 72, Life 14). Some of the members are

enrolled under one of the last two classes by virtue of gifts or services rather than by cash payments of the membership fee of the given class; such memberships, of course, do not represent annual income. Membership is not only a means of securing special privileges in addition to those enjoyed by the general public; it is also an opportunity to participate in a work of great civic and educational importance.

Girls Commercial High School Memberships.—One of the most delightful gifts was received on May 28, through the Department of Elementary Instruction from our valued neighbor, the Girls Commercial High School, Mrs. Evelyn W. Allan, principal. The gift consisted of \$50 in cash and checks to cover five annual memberships—one in the name of a teacher, Miss M. Catherine Devin, and four in the name of the school. This lovely and neighborly deed was instigated and carried through by another teacher, Miss Ruth Losee.

BEQUESTS AND GIFTS

Maddock Bequest.—Mr. Sidney Maddock, of Brooklyn, deceased December 10, 1936, included the Brooklyn Botanic Garden among the beneficiaries of his will (probated March 3, 1937) with a bequest of \$10,000. On November 6, 1937, the Treasurer's office received from the administrators a remittance of \$5000 on account. At the close of the year the estate was still in process of being settled. The paragraph in the will relating to the Botanic Garden reads as follows:

“To Brooklyn Botanic Garden the sum of Ten thousand dollars (\$10,000). Said fund to be known as ‘Gift of Sidney Maddock,’ to be used to make some needed improvement in the garden of said corporation. Said improvement shall be designated and placarded in the manner customary by said corporation.”

Anonymous Gift.—Soon after the decease, early last spring, of a valued friend of the Botanic Garden, who wished to remain anonymous, and in fulfillment of an expressed wish, the Garden received an addition to its endowment of \$250,000. In accordance with instructions, \$2,500 of the annual income is to be devoted to botanical research so long as the present director remains in office. Interest on this fund began to accrue to the Garden on May 1, 1937.

Bronze Statue for the Rose Garden.—On July 13 Mrs. Walter V. Cranford, of Greenwich, Conn., presented for the Rose Garden a bronze statue, "Roses of Yesterday," by Harriet Frishmuth. The statue, five feet, three and one-half inches in height, represents a young girl holding a bouquet of roses in her right arm, and in her left arm a sun dial. Mrs. Cranford was co-donor with her husband, the late Mr. Walter V. Cranford, of the main Rose Garden, and in 1936 she bequeathed the Rose Arc as an extension of the Garden and as a memorial to her husband. The statue, also in memory of Mr. Cranford, has been placed in the main Rose Garden where it adds much charm. It was approved, together with the setting, by the Art Commission of the City of New York at its meeting held July 13, 1937.

The gifts received during the year are recorded on pages 104–113, following. These have all been acknowledged with the thanks of the Botanic Garden Governing Committee of the Trustees. The large number of friends of the Garden is reflected by the fact that more than 400 donors have, during the year, made contributions of money, plants, herbarium specimens, books, and other objects that have enriched our collections or facilitated our work in some other way.

FINANCIAL

Diminished Income.—For the first time in the twenty-seven years of its existence the Garden, in 1937, began a year without a balanced budget. As of January 1, the budget difference was \$9,592 in a total operating budget of \$178,642. The budget was \$5,130 less than for 1936, and \$48,055 less than in 1929, when the total (Tax Budget and Private Funds combined) was \$226,697. To say that the Garden has suffered a serious loss of Private Funds income from contributions and interest on invested funds states a fact that every one, of course, must know in view of the economic history of the world during the past eight years. The budget difference was further increased by the fact that the Tax Budget appropriation was sufficient to meet the minimum weekly pay roll only until September 15.

A special appeal was made for contributions, rigid economies were closely adhered to, and the Director of the Budget was asked to approve a request to the Board of Estimate and Apportionment for a supplementary appropriation for wages. The deficiency

finally was met as follows:

1. Supplementary Tax Budget appropriation.....	\$5,203.75
2. Special contributions of Private Funds.....	2,152.45
3. Increased economies.....	2,236.53
Total.....	<u>\$9,592.73</u>

We closed the year without a deficit.

Except for the supplementary Tax Budget appropriation for Wages it would have been necessary for us to reduce our *per diem* force. The present force is not adequate for maintaining the plantations at the standard proper for a public botanic garden. The amount appropriated by the Board of Estimate for Wages for 1938 (\$17,500) is \$263.75 less than the amount expended for 1937.

Tax Budget and Private Funds

The figures for the past two years are as follows:

	<i>1936</i>	<i>1937</i>	<i>Change</i>
Tax Budget.....	\$ 89,944.31	\$ 89,457.75	\$ 486.56 Dec.
Private Funds.....	93,157.88	90,066.71	3,091.17 Dec.
	<u>\$183,102.19</u>	<u>\$179,524.46</u>	<u>\$3,577.73 Dec.</u>

For the past eight years the percentages of the two budgets have been as follows:

	<i>1930</i>	<i>1931</i>	<i>1932</i>	<i>1933</i>	<i>1934</i>	<i>1935</i>	<i>1936</i>	<i>1937</i>
Tax Budget....	44%	48%	50%	47.2%	49.2%	48.3%	49.1%	49.8%
Private Funds—	50%	52%	50%	52.8%	50.8%	51.7%	50.9%	50.2%

The 1937 Tax Budget appropriation was \$20,453.20 less than requested, as follows:

	<i>Requested</i>	<i>Granted</i>	<i>Difference</i>
Personal Service.....	\$ 90,611.95	\$76,192.75	\$14,419.20 Dec.
Other Codes.....	19,299.00	13,265.00	6,034.00 Dec.
	<u>\$109,910.95</u>	<u>\$89,457.75</u>	<u>\$20,453.20 Dec.</u>

The initial Tax Budget appropriation for Personal Service for 1937 was \$69,068.92. On July 1 Emergency Salary Cuts, made January 1, 1933, on all salaries of \$2,000 or more, in the total amount of \$3,804.26, were restored. The total amount of the restoration for the half year, July-December 31, was \$1,902.13. This restoration plus the supplementary appropriation of \$5,203.75 for wages brought the Personal Service appropriation to the final total amount as shown above.

Endowment Increment Plan.—As noted in previous reports, the Governing Committee, on January 11, 1921, approved a recommendation of the director that only four-fifths of the income of certain permanent funds be expended, the remaining one-fifth to be invested and the interest income added to the principal annually, to build up an "Endowment Increment Fund." The principal, at the beginning of 1937, amounted to \$134,671.65. Since January 1, 1936, no additions to the principal from the "contributing funds" have been possible. During 1936 a portion of the interest income had to be used, and during 1937 all of the interest income has been required. If it had not been for the income from this fund the budget difference at the beginning of 1937 would have been greater. It is hoped that the Garden's finances may so improve in the near future that the Endowment Increment plan may be resumed and continued until the principal amounts to a more substantial addition to the endowment. As the life of institutions is measured, it would not take many years for the principal to amount to one million dollars, and that should be the first goal for the fund.

The General Situation.—A report to the Financial Advisory Service of the American Council of Education, concerning endowment income and investments of educational institutions for the period 1926–1935, states that levels of endowment income for the last three years of the period were 50 to 75 per cent. below those for the previous seven years, and "can be expected to continue so at least for the near future in the light of the present conditions of the security market."

While the endowment principal of forty-five institutions, over the same ten-year period, increased by 52 per cent., the dollar income from interest on the invested funds increased only 30.5 per cent.

For the Botanic Garden, during the ten-year period, 1928–1937, endowment principal increased by approximately 52 per cent. (from \$892,880.89 to \$1,354,020.96), while dollar income from interest has increased by only about 16 per cent. As the above cited report states, for recovery of income educational institutions must, for some time to come, look to new gifts and bequests rather than to a restoration of interest rate.

Recovery and Contributions.—A national journal has recently published the following information based on United States Internal Revenue Statistics. Our national income for 1936 was 61 per cent. greater than for 1932. During the same period contributions for social welfare fell off as follows: Churches, 30% decrease; general benevolencies, 29% decrease; community chests, 24% decrease; colleges, 18% decrease. At the same time expenditures for certain purposes *increased* as follows: Jewelry, 25%; theatres, 41%; cigarettes, 48%; automobiles, 203%; radio, 302%.

During this period the incomes of those having relatively small incomes, have slightly increased, while the incomes (especially the net incomes) of those having relatively large incomes have, on the whole, greatly decreased. It is the latter group who have had the tradition and habit (as well as the ability) of contributing to public institutions; it is on them in particular that scientific and educational institutions, other than those supported by taxation, have largely depended for support. For these institutions capital is a fundamental necessity to insure financial stability; for their own capital they are dependent on contributions and bequests out of private capital. Legislation and propaganda calculated to weaken or destroy private capital is a vital blow not only to trade and industry, but also to science and art and education.

Respectfully submitted,

C. STUART GAGER,
Director.

REPORTS ON RESEARCH FOR 1937

PLANT PATHOLOGY

BY GEORGE M. REED

Influence of the Growth of the Host on Smut Development

A final series of experiments on this problem was carried out. One specialized race of loose smut and two of covered smut were used to inoculate certain oat varieties. The plants were grown under different conditions with reference to the supply of nitrogen, phosphorus, and potash. The influence of external factors,

such as temperature and moisture, were eliminated, as far as possible, by germinating the seed under the most favorable conditions for penetration of the smut fungus.

The results confirm those which have been obtained in previous years. While there were very marked differences in the rate of growth and development of the oat plants, there appeared to be no correlated variations in the infection results.

These investigations have been supported in part by a grant from the Penrose Fund of the American Philosophical Society.

Studies on the Inheritance of Resistance of Oat Hybrids to Loose and Covered Smuts

Additional data were obtained on the third and fourth generations of Hybrid 83, Canadian \times Black Norway, Hybrid 84, Scottish Chief \times Black Mesdag, Hybrid 85, Black Mesdag \times Danish Island, and Hybrid 86, Monarch Selection \times Gothland. The results supplement the data obtained in previous years on the behavior of second and third generation plants of these hybrids.

In collaboration with Mr. T. R. Stanton, Senior Agronomist, Division of Cereal Crops and Diseases, Bureau of Plant Industry, Washington, D. C., the results for some oat hybrids, obtained over a number of years, were published. Hybrid 61, Seizure \times Victor, and Hybrid 62, Scottish Chief \times Victor, were characterized by both parents being fully susceptible to loose smut, while one parent, Victor, was susceptible to the covered smut. A high degree of susceptibility to the loose smut was obtained in the second and third generations. With the covered smut the resistant quality appeared to be inherited on the basis of a single factor difference. Hybrid 63, Gothland \times Monarch, Hybrid 64, Rossmann \times Monarch, Hybrid 65, Danish \times Monarch, Hybrid 67, Seizure \times Monarch, and Hybrid 68, Monarch \times Scottish Chief, involved crosses in which one parent was susceptible to loose smut and the other, Monarch, to the covered smut. The data indicated that resistance to the two smuts is inherited independently. The hybrids gave rather low percentages of infection with loose smut in the second generation, and there was also a shortage of resistant third generation families. The evidence, however, seemed to indicate that the inheritance of resistance to

both smuts in these hybrids is controlled by distinct single factors. Hybrid 66 involved Danish Island, susceptible to loose smut and moderately so to the covered, and Monarch, susceptible to the covered smut. A single factor relationship for resistance to loose smut, with resistance dominant, was indicated. In the inheritance of resistance to covered smut, however, susceptibility appeared to be dominant.

Several new crosses between oat varieties were made in 1936, the first generation plants being grown last year. The inoculated second generation plants are now growing and, in the coming year, will furnish data on the mode of inheritance of resistance in these particular crosses.

Physiologic Races of the Oat Smuts

Additional experiments were carried out with collections of both loose and covered smuts in order to determine the extent of their physiologic specialization. A new specialized race on Black Mesdag was obtained. This variety is noted for its high degree of resistance to all races of both loose and covered smuts hitherto known, except the Fulghum races of covered smut. A collection of covered smut obtained from Prof. H. L. Shands, University of Wisconsin, Madison, Wis., appeared to be quite distinct.

We have continued our cooperation with Mr. T. R. Stanton on physiologic specialization of the oat smuts. The Division of Cereal Crops and Diseases is especially interested in the development of new varieties of oats which show a high degree of resistance to various diseases, including the smuts. Several of the new promising strains were forwarded by Mr. Stanton in order to have them tested with our known specialized races of both species of smuts. There were sixteen selections of the cross Victoria \times Richland which were tested with 11 collections of loose smut and 8 of the covered. Twenty promising selections, involving several different parental varieties, also were tested with these same collections of smut. Practically all of these proved to be highly resistant. Another series of thirty-five selections of a cross between Richland and Fulghum were tested particularly with the Red Rustproof and Fulghum races of smuts. These selections have been developed at the Kansas Agricultural

Experiment Station, and some of them showed a high degree of resistance, while others seemed to be somewhat susceptible to the Fulghum races of both loose and covered smuts.

Studies on Cultures of the Oat Smuts

Dr. L. Gordon Utter has continued his investigations on the cultural characteristics of the loose and covered smuts of oats grown in artificial media in flasks, and also his hybridization experiments between the two species. The extensive data obtained over a period of years have been prepared for publication and have been accepted by Columbia University as the basis of a thesis for the degree of Doctor of Philosophy.

Single sporidial, single chlamydospore, and dilution cultures for eleven physiologic races of the loose smut and seven of the covered smut of oats have been studied. The size, color, and topography of the colonies were determined for 274 culture sets of the former and 307 of the latter. The individual cultures comprising the different triplicate sets were generally dissimilar. Approximately 60 per cent. of all the triplicate sets of both smuts showed dissimilarities.

Successive culture generations failed to remain constant in characteristics, regardless of the method of isolation. The different single chlamydospore and dilution cultures of respective races were usually distinct from one another, while the single sporidial cultures could be roughly grouped into four classes.

Similarities or dissimilarities between the races of both the loose and covered smuts were obtained by proper selection of cultures. It was concluded that the cultural characteristics did not offer a definite means for the identification of the races of loose or covered smuts studied.

Hybridization between a race of loose smut and one of covered was accomplished. It was first demonstrated that cultures developed from single sporidia of both smuts would not produce infection on susceptible varieties. When the proper mixture of two sporidial cultures was made, infection resulted, and the mixture of a certain culture of loose smut with one of the covered smut infected the variety Monarch, while Gothland remained resistant. The smut which developed had the symptomatic and

morphologic appearance of the loose smut. The spores produced on Monarch were used to inoculate a series of oat varieties and, by successive inoculations over a period of years, several new types of smut were produced which exhibited recombinations of factors for symptoms, morphology, and pathogenicity. Some of the new covered types produced infection on Gothland and not on Monarch and others infected both of these varieties. There were also several new types of loose smut which infected Monarch but not Gothland, and one or more types which infected both of these varieties approximately 100 per cent. Thus, new specialized types, or races, were produced through hybridization, since the original race of loose smut infected only Gothland, and that of covered smut, only Monarch.

Sorghum Smut Investigations

Dr. D. Elizabeth Marcy has published, during the past year, the extensive data obtained on the inheritance of resistance of various sorghum hybrids to the loose and covered kernel smuts. In these particular hybrids two types of resistant varieties, Feterita and Dwarf Yellow Milo, were crossed with susceptible varieties. These publications were accepted as a thesis for the degree of Doctor of Philosophy at Columbia University.

The experiments on the effect of temperature, moisture, and sucrose solution on the infection of Black Amber and Red Amber Sorgho, Dawn Kafir, Shallu, and Feterita, with the covered kernel smut, were continued. Seeds of these varieties were germinated in sand with a moisture content of 10, 20, 30, 40, and 50 per cent. of the total water holding capacity. In one series, water was used to moisten the sand, and in another series a 2 per cent. sucrose solution. Constant temperatures of 15, 17.5, 22.5, 27.5 and 30° were employed during the germination period. After the seedlings emerged, they were transplanted to the field, where they grew to maturity.

It was found that 10 per cent. moisture was most conducive to high infections at all temperatures and for both the water and sucrose solution series. At temperatures of 15 and 17.5°, slightly higher infections were obtained in the water series; the reverse was true at temperatures of 27.5 and 30°. At tempera-

tures of 20, 22.5 and 25° infections were higher in the sucrose solution series when the moisture content of the sand was low, but higher in the water series when the moisture content of the sand was high.

The resistant variety Dwarf Yellow Milo was used throughout both the series of experiments, but no infected plants were observed.

The effect of an unusually heavy inoculation of chlamydospores of covered kernel smut upon infection was also tested. Three sets of inoculated seeds were grown, one dusted with the usual number of spores, somewhat more than would actually cling to the seeds, the second dusted with sufficient spores to make a layer of smut over the seeds when planted, and the third set with the usual number of spores of covered kernel smut, and a surplus of viable spores of loose smut of oats, *Ustilago avenae*. The third set had about the same quantity of spores over the seed as in the second set. The heavy inoculation with covered kernel smut lessened the percentages of infection obtained, except when the moisture content was very low. The addition of the spores of *U. avenae* brought about a very marked decrease in the percentage of infected plants.

The measurement of the height of week old, both inoculated and uninoculated seedlings, was taken. 16,200 seedlings were measured, half of which were germinated in water and the rest in the sucrose solution. It was found that seedlings, whether inoculated or uninoculated, were somewhat shorter when germinated in sand moistened with the sucrose solution than when germinated in the water moistened sand.

THE IRIS

BY GEORGE M. REED

Farmingdale Iris Garden

In the Brooklyn Botanic Garden RECORD for April, 1936, an account of the Farmingdale Iris Garden was given. This garden is a cooperative development between the State Institute of Applied Agriculture on Long Island and the Brooklyn Botanic Garden. The iris species and varieties have been furnished by

the Garden, and the plantings are being maintained by the Institute in suitable surroundings, where they are available for study and inspection by all persons and organizations interested. The Iris Garden is primarily intended as a display garden for collections of representative varieties of both bearded and beardless iris.

Most of the garden was planted in the summer and fall of 1935. Of the beardless iris groups, the Japanese were represented by 245 varieties and the Siberian by 50. Neither of these groups produced much bloom in 1936 but, during the past year, they were in very fine condition, practically all of the varieties blooming abundantly, giving large flowers on fairly tall stems.

The bearded iris, represented originally by approximately 350 varieties, gave about 50 per cent. bloom in 1936. Unfortunately, in July and August, rhizome rot appeared, causing very extensive damage, which necessitated the complete replanting of these varieties. In 1937, good flowers developed on somewhat more than 50 per cent. of the plants. Again, in July and August, rhizome rot developed and destroyed a large proportion of the plants, making it necessary to lift and reset them.

A large number of Japanese varieties have been planted in special sections for propagation on the Institute grounds. Some of the earlier plantings were utilized in connection with iris thrips control. On practically all of these which had been planted in 1935 or early 1936, excellent bloom was obtained, the flowers being large, on well developed stalks. The fine material made it possible to check the varieties for correctness of identification. Some of the earlier propagation sections were abandoned this year, most of the varieties being reset in a new area in accordance with changes in identification. In another year or two they should again provide excellent material for study. Exchanges of varieties were made with iris growers, thus increasing our own collection of newer varieties, particularly of the bearded type.

Soft Rot of the Iris Rhizome

During the last two or three years the soft rot of the rhizomes of the bearded iris has become a very serious matter. Extensive damage has occurred in the varieties growing in the Farmingdale Iris Garden, necessitating the lifting and resetting of all these

varieties in both 1936 and 1937. Considerable damage was done to the planting at the Botanic Garden in 1936, the injury being greatly increased in 1937.

Many experiments were carried out trying to find a preventive for this disease, various chemicals being tried. None proved to be particularly effective. The most successful procedure seemed to be to lift the plants when the soft rot appears, clean them up, let them dry for a few days, and then reset in new beds. This procedure, however, interferes greatly with the successful establishment of the plants and the production of abundant bloom in later years. Further experiments are in progress, however, and perhaps effective methods may be developed. It may be noted that the iris borer, which is so commonly associated with this disease, has not appeared in the plantings either at the Institute or at the Brooklyn Botanic Garden.

Iris Thrips Control

For some years, experiments on the control of the iris thrips have been undertaken in cooperation with Dr. C. A. Weigel and Dr. Floyd F. Smith of the Division of Truck Crop and Garden Insect Investigations, Bureau of Entomology and Plant Quarantine, Washington, D. C. Most attention has been given to the beardless iris, especially the Japanese varieties, which have been severely infested with thrips in the plantings at the Brooklyn Botanic Garden. It has been found that immersion in water at 110° F. for thirty minutes was effective in killing the thrips. If this is done at the proper time of the year, no serious set-back to the iris occurs. Most of the treatments have been carried on at the Botanic Garden and the treated plants, for the most part, have been taken to the Institute at Farmingdale and planted. The results have been written up by Dr. Floyd F. Smith and Dr. L. G. Utter, and published as *Circular 445* of the U. S. Department of Agriculture.

During the past year, interesting results on the control of these insects by spraying have been obtained, and some of the promising lines will be followed up the coming season.

We have had the cordial cooperation of Director H. B. Knapp and his associates of the State Institute in providing the land and cultivating the iris plantings.

GRADUATE STUDENTS AND INDEPENDENT INVESTIGATORS
ENROLLED DURING 1937

Dr. Harry G. Albaum, Department of Biology, Brooklyn College, utilized the laboratory facilities for his studies on the influence of hormones on the outgrowth of adventitious sprouts from fern prothallia, and on the outgrowth of leaves from young fern plants. The results of his investigation formed the basis for a thesis for the degree of Doctor of Philosophy at Columbia University.

Mr. Paul F. Brandwein, a graduate student of New York University, has continued some of his studies on the loose and covered smuts of oats. His data on the latent infection of resistant oat varieties inoculated with loose and covered smuts have been published.

Dr. Elva Lawton, Biology Department, Hunter College, has continued her studies on regeneration and polyploidy in ferns.

FOREST PATHOLOGY

BY ARTHUR HARMOUNT GRAVES

Chestnut Breeding Work in 1937

Our original project was the combination, in a new chestnut stock, of the blight resistance of the oriental chestnuts with the tall-timber quality of the American chestnut. Now, with increased facilities for hybridization, the scope of our activities has been enlarged to include qualities of nuts, age and season of flowering, resistance to cold, drought, and insect attacks, and other desirable traits.

Outside Assistance.—It is a pleasure to mention the encouraging words and offers of material assistance from many friends. In December, 1936, we received through the Hon. Gifford Pinchot of Pennsylvania and Dean Henry S. Graves of the Yale School of Forestry at New Haven, a contribution of funds from Mr. Godfrey L. Cabot of Boston. In addition, for the second year in succession, we received through the National Research Council, Washington, D. C., a grant-in-aid from the National Academy of Sciences; and during the summer the Division of Forest Pathology, U. S. D. A., helped us financially.

In response to my appeal, in last year's report, for more land on which to plant our trees, several people came forward with generous offers. Literally hundreds of acres are now available to us whenever we are ready to plant them.

By the cordial cooperation of the Northeastern Forest Experiment Station at New Haven, through its Director, Mr. C. Edward Behre, and of Dr. E. J. Schreiner of the same station, the assistance of several trained technical assistants was given to us during the flowering season of the chestnuts, in June and July. Largely as a result of this help, we harvested in October 704 hybrid nuts. When we began our hybridizing work, in 1930, we were much elated at the result—10 nuts. The results this year are indeed a contrast, and we must emphasize the fact that without the conscientious and enthusiastic assistance of the young people who joined us for this period, so rich a harvest could not have been obtained.

Pollen of the chestnut was received at Hamden, Conn., from the following institutions or persons, whose splendid cooperation we take pleasure in acknowledging:

- June 26. Division of Forest Pathology, Washington, D. C. Pollen of *C. sativa* and "Boone" (*C. crenata* × *C. dentata*); also *C. dentata* (F. P. 555).
- June 30. Mr. Alfred J. Frueh, West Cornwall, Conn. *C. dentata*.
- July 1. Mr. J. J. McKenna and Mr. Walter J. Henning, Reading, Pa. *C. dentata*.
- 7. Mr. Samuel Eliot Codman, Bolton, Mass. *C. dentata*.
- 12. Professor H. M. Jennison, Great Smoky National Park, Tenn. *C. dentata*.
- 13. Mr. Milo N. Wood, Bureau of Plant Industry, U. S. D. A., Sacramento, Calif. *C. sativa*.
- 13. Mr. Alfred Rehder, Arnold Arboretum, Jamaica Plain, Mass. *C. sativa*, *C. pumila*, and *C. neglecta* (*C. dentata* × *C. pumila*).
- Aug. 20. Professor Frederick S. Baker, University of California, Berkeley, Calif. *Castanopsis sempervirens*.

If pollen does not reach us before July 4, it is in most cases too late for us to use it. However, some of the late arriving pollen we used on *C. Seguinii*, which blooms all summer.



FIG. 3. Japanese-American chestnut hybrid grafted on Japanese stock. Note contrast, at right, between growth from stock and that from scion. At left, graft was made lower down, and scion has grown about 5 feet in one year. Photo Oct. 3, 1937. (9540)

Hybrids of 1937.—The following is a list of the hybrid nuts secured in 1937 from the cross pollinations at Hamden. 373 of these are F_2 's—i.e. second generation hybrids. As usual, the name of the female or pistillate parent is given first. Those which are starred at the left are new to science. The numbers in parentheses, also at the left, correspond to the numbers of the notes following the list of hybrids.

HYBRIDS OF 1937

All at Hamden, Connecticut

No. of Nuts

- 40 Japanese (*crenata*) crossed with American (*dentata*)
- 40 Japanese (*crenata*) crossed with Japanese-American (*crenata* × *dentata*)
- 2 American (*dentata*) crossed with Hairy Chinese (*mollissima*)
- 48 Hairy Chinese (*mollissima*) crossed with American (*dentata*)
- (1) 172 Hairy Chinese (*mollissima*) crossed with Japanese-American (*crenata* × *dentata*)
- *(2) 3 Chinese chinquapin (*Seguinii*) crossed with American (*dentata*)
- *(2) 4 Chinese chinquapin (*Seguinii*) crossed with chinquapin (*pumila*)
- *(2) 4 Chinese chinquapin (*Seguinii*) crossed with Spanish (*sativa*)
- * 25 S8 (*crenata* × *pumila*) crossed with Spanish (*sativa*)
- * 16 S8 (*crenata* × *pumila*) crossed with Chinese chinquapin (*Seguinii*)
- 1 S8 (*crenata* × *pumila*) crossed with "Boone" (*crenata* × *dentata*)
- (3) 109 Japanese-American (*crenata* × *dentata*) crossed with Japanese (*crenata*)
- 2 Japanese-American (*crenata* × *dentata*) crossed with Spanish (*sativa*)
- (4) 219 Japanese-American (*crenata* × *dentata*) crossed with Japanese-American (*crenata* × *dentata*)
- *(5) 2 Japanese-S8 [*crenata* × (*crenata* × *pumila*)] crossed with Japanese-S8 [*crenata* × (*crenata* × *pumila*)]
- * 2 Japanese-American (*crenata* × *dentata*) crossed with Hairy Chinese-Chinese chinquapin (*mollissima* × *Seguinii*)
- *1 Hairy Chinese-Japanese (*mollissima* × *crenata*) crossed with Spanish (*sativa*)
- *1 Hairy Chinese-Japanese (*mollissima* × *crenata*) crossed with American (*dentata*)
- *(6) 2 Hairy Chinese-Chinese Chinquapin (*mollissima* × *Seguinii*) crossed with Japanese (*crenata*)
- *(6) 5 Hairy Chinese-Chinese Chinquapin (*mollissima* × *Seguinii*) crossed with Spanish (*sativa*)
- *(6) 3 Hairy Chinese-Chinese Chinquapin (*mollissima* × *Seguinii*) crossed with Japanese-American (*crenata* × *dentata*)
- *(6) 3 Hairy Chinese-Chinese Chinquapin (*mollissima* × *Seguinii*) crossed with Hairy Chinese-Chinese Chinquapin (*mollissima* × *Seguinii*)

(Total) 704 hybrid nuts

(1) Most of these are results of a cross with our splendid Japanese-American (H 86-31), which now at the age of six years is 19 feet high. Inoculation tests show that this is rather susceptible to the blight. These crosses, therefore, represent an effort to combine some of the practically immune Chinese chestnut stock with this hybrid stock. I believe that they are the most important crosses we made this year.

(2) These crosses were made merely because various pollens arrived at Hamden so late that there was nothing but the "everblooming" *Seguinii* to put them on. It would, however, be convenient to have some everblooming hybrids from this Chinese chinquapin for use in further breeding work.

(3) These represent back crosses of good Japanese-American hybrids with disease-resistant Japanese stock.

(4) These are all intercrosses of good Japanese-American hybrids.

(5) These trees, hybrids of the *Chuguri* nuts (received by Dr. Reed of this Garden in 1931 from Japan; see notes 11 and 12, p. 68 of Brooklyn Botanic Garden Record, Vol. 25, 1936) and of S8, bloomed this year in their second year. We crossed them with each other, and as a result got two fine nuts, these representing, therefore, a third generation. The original Japanese parent is vigorous and healthy—not tall ($7\frac{1}{2}$ feet high this year—6 yrs. old)—with two green labels as the result of inoculation tests to date (see p. 50). It is promising stock for chestnut orchardists.

(6) The last four crosses were made on a hybrid of Hairy Chinese with Chinese chinquapin (*C. Seguinii*) from a nut borne in 1934. This hybrid bloomed well for the first time, in this its third year of growth, was prolific like its chinquapin parent, and, moreover, continued blooming well into July, thus also showing Chinese chinquapin characters (Fig. 4).

Summary of New Hybrids.—Thirty-two hybrids new to science have resulted from our crosses to date. With three exceptions, all these new hybrids are represented by living trees. Of course, none of the new hybrids of 1937, although the nuts were planted last fall, are as yet set out on the plantations. Three hybrids (*C. mollissima* \times *C. dentata*, 1934; *C. mollissima* \times *C. Seguinii*, 1934; and *C. crenata* \times *C. Seguinii*, 1935) published as new in previous reports, are published in the U. S. D. A. Yearbook for



FIG. 4. Chestnut Hybrid, *C. mollissima* \times *C. Seguinii*. 3 yrs. old, 4 ft. 6 in. high. See note (6) pages 47, 48. Cloth bags are put on all crosses about Sept. 15, both to outwit squirrels and to preserve identity of nuts in case they should fall out of bur before being harvested. Note wooden labels giving data of each cross. The bag on the top cluster of burs has been temporarily removed to show sample of contents. Oct. 3, 1937. (9449)

1937 (August), indicating that they were made prior to our own publication.

Table Showing Growth of a Few Best Hybrids

Year When Nut Was Produced	Name	Number	Height			
			1936		1937	
			ft.	in.	ft.	in.
1931	Hammond— <i>crenata</i> × <i>dentata</i>	H86-31	14	10½	19*	
"	" — " "	H94-31	9	6	11	4
"	Winthrop — <i>crenata</i> × <i>dentata</i>	W40-31	9		13	
"	Smith — " "	S170C-31	10	6	13	6
"	" — " "	S200B'-31	10		11	6
"	" — " "	S239-31	10	9	14	
1932	" — " "	110-32	9	10	13	
1933	Minturn — " "	M19'-33	6	8	11*	
"	Hammond — " "	H118A'-33	6	1	10	
1934	S8 × <i>crenata</i>	9B-34	3	5	5	10
"	<i>mollissima</i> × <i>Seguinii</i>	20-34	3	4	4	8
1935	<i>dentata</i> × S8	LI60B-35	2	4	5	
"	S8 × <i>dentata</i>	40-35	1	9	5	2

* Year's growth, more than four feet.

Inoculation Tests for Disease Resistance.—In our last report we told of inoculating all our trees, both hybrids and species, with the blight fungus to get a definite idea of the relative resistance or susceptibility of each individual. We have continued with this work in 1937 and have developed a system of marking the trees on their performances as follows:

Immune (100% resistance)—*White Label*

Slight susceptibility to fungus, i.e. mycelium grows a little in bark, but no fruiting bodies are formed nor is branch killed (75% resistance)—*Green Label*

Susceptibility and resistance about half and half. No fruiting bodies formed but mycelium grows well in bark. Branch still alive at end of first year. (50% resistance)—*Yellow Label*

Susceptibility more pronounced, fruiting bodies formed in bark. Branch (to ¾ inch diameter) killed by end of first year. (25% resistance)—*Orange Label*

Susceptibility at a maximum, fruiting bodies quickly formed,

branch quickly girdled and killed. (no resistance)—
Red Label

As a result of our two years of inoculations we find that, in general, the results correspond. One more year's work will finish the testing for the larger trees; many younger ones will soon be old enough to inoculate. In 1936 the inoculations were made during the end of July and the first part of August; this year about two weeks earlier.

After two years' testing, we find that the Japanese-American hybrids on the whole are susceptible to the disease, with a few exceptions. In two cases these hybrids have so far shown absolute resistance. Two trees of our Chinese species (*C. mollissima*) have also shown absolute resistance and one tree of our Japanese species (*C. crenata*). In general, the Chinese are the most resistant of all the trees, with the Japanese considerably behind. One of the Folk Japanese has proved 100% resistant to the inoculations, but the "Folks" are very variable: some are fairly susceptible. The Spanish chestnuts (*C. sativa*) are very low in resistance. The Americans (*C. dentata*), as far as we have tested them, are the poorest of all; and, as a matter of fact, several of our young Americans died last year as a result of these inoculations.

Cutting out the Blight.—Since we wish to save some of our Japanese-American hybrids for further breeding (on account of such desirable characters as rapid growth rate and erect habit) I have been cutting out any diseased spots in the bark; and I have found that healing occurs, and, so far at least, the disease has not reappeared.* This is a very difficult operation to perform successfully on American chestnut.

Grafting.—We grafted our best Japanese-American hybrid (H86-31) on pure Japanese stock with the result shown in Fig. 3. Scions of Chinese chestnut were also successfully grafted on *Quercus montana*, the Chestnut Oak, and on *Quercus velutina* and *C. coccinea*, the Black and Scarlet Oaks. The graft on the Black Oak lived only until September, however.

* Likewise, Gravatt (Farmers' Bull. 1641, "Chestnut Blight," p. 17. U.S.D.A. 1930) says that "most of the oriental trees can be saved by systematically cutting out any cankers that may appear and then painting the wounds."

Planting of Nuts from Open Pollinations.—With the help of young men from the Northeastern Forest Experiment Station at New Haven, we planted about 750 nuts, mostly of Chinese or Japanese parents, in the open ground, about six feet apart. More than 1000 others were planted in cold frames and will be set out in the spring, when they germinate. These plantings are being made in order to determine whether we can establish a forest by this method, and also because some of these nuts may represent valuable chance crosses.

Vegetative Propagation.—We continued the layering experiments, but, it would be a long process to obtain by such a method a good supply of young trees for reforestation. If it is possible, we must propagate the disease-resistant stock from cuttings. For this purpose we placed in a cold frame a mixture of equal parts of clean sand and peat moss. Cuttings of chestnut treated with hormodin of the 20-unit strength were placed in this mixture during the first week of August and again in the first week of September. No rooting occurred, although cuttings of tomato and Jerusalem cherry put in at the same time rooted well. In 1938 we shall try to root cuttings taken earlier in the season.

This problem of vegetative propagation is now the greatest obstacle to be overcome. There is every indication that we can develop by continued breeding not only one, but several types of chestnut that will be blight resistant and superior in other respects to the American species. But, as we said in our last report, in all probability such types (being hybrids) will not breed true from seed any more than our cultivated apples, pears, peaches, etc. can be depended upon to breed true from seed. Therefore the stock must be propagated vegetatively.

Somatic or Bud Variation.—Last summer we found on one of our Chinese chestnuts a “bud sport”—a small branch bearing variegated leaves. The explanation of this is that the cells giving rise to that branch (or to the leaves) had undergone changes in their protoplasmic material such that these variegated leaves were produced. In the Eastern United States, where the chestnut once reigned as a forest monarch, we find occasional young shoots from old stumps. In recent years these seem to live longer than formerly before they finally succumb to the blight.

Whether this is due to the fact that each year there are fewer spores of the parasite abroad, or to the decreasing virulence of the parasite, or to "bud sporting" in the direction of more blight-resistant stock, can not be definitely stated on the basis of the evidence at hand.

To enable us to study this problem further we particularly desire to receive nuts borne on these basal shoots of native chestnut. They should not be allowed to become dry before they are mailed to us. A few days in a heated room are apt to be fatal. They should be wrapped in moist cotton, paper napkins, or moss, immediately after gathering, and mailed to the Brooklyn Botanic Garden. All such nuts will be carefully planted by us, and the resulting trees labelled with the name of the finder and the locality. We already have 76 such trees, from nuts coming from locations ranging from Asheville, North Carolina, to Portland, Maine.

A list of nuts, with their senders, which were received in 1937, follows:

*Nuts Received from Outside Sources and Planted
in Cold Frames, Fall of 1937*

- Sept. 28. *Castanea dentata* from Mr. Frederick M. Adler, New Haven, Conn.
- *Oct. 1. *C. dentata* from Mr. Gilbert L. Smith, Wassaic, N. Y.
C. dentata × *C. crenata* from Mr. Gilbert L. Smith, Wassaic, N. Y.
- Oct. 3. *C. dentata* from Mr. Gilbert L. Smith, Wassaic, N. Y.
- Oct. 7. *C. dentata* from Mrs. Thomas P. Boyd, South Kent, Conn.
C. dentata from Mr. F. G. Guntner, White Plains, N. Y.
C. dentata from Mrs. F. C. Nicodemus, Smithtown Branch, L. I.

* Mr. Gilbert L. Smith, Farm Supervisor at the Wassaic State School, Dutchess Co., N. Y., has found two very good, evidently somewhat disease-resistant, native Americans (not sprouts) in his neighborhood, and during the summer he intercrossed them, as well as pollinating some females with Japanese pollen. Most of the resulting nuts he turned over to us for planting and culture. We shall report on them further next year. Mr. Smith sent us also many nuts from native sprouts near Wassaic.

- C. sativa* (?) from Vevey, Switzerland, through Dr. D. F. Crane, Montclair, N. J.
- Oct. 30. *C. dentata* from the Blue Ridge Mts., Va., through Dr. J. Russell Smith, Swarthmore, Pa.
- C. dentata* from Mrs. C. L. Hyde, Litchfield, Conn.
- C. ozarkensis* from Garfield, Benton Co., Arkansas, through Prof. D. M. Moore, Russelville, Ark.
- Nov. 3. *C. crenata* from Mr. W. J. Genko, Nanuet, N. Y.
- Nov. 17. *C. dentata* from Cadillac, Michigan, through Dr. John M. Carter, Detroit, Mich.
- Nov. 20. *C. crenata* from Mr. Christopher M. Gallup, N. Stonington, Conn., through Mr. Austin F. Hawes, Conn. State Forester.

Inventory.—Following is a complete list of the numbers of individuals of all the species, varieties, and hybrids now growing on our Hamden plantations, making a total of 755 trees.

Chestnut Species, Varieties, and Hybrids
Growing at Hamden, Connecticut
October, 1937

Name	Number of Trees
<i>Castanea Ashei</i> —Ashe Chinquapin	11
<i>C. crenata</i> —Japanese Chestnut	38
<i>C. crenata</i> (Forest Type)—Japanese Chestnut var.	46
<i>C. dentata</i> —American Chestnut	76
<i>C. Henryi</i> —Chinese Timber Chinquapin	13
<i>C. mollissima</i> —Hairy Chinese Chestnut	68
<i>C. mollissima</i> var. Mammoth—Chinese Chestnut var.	2
<i>C. ozarkensis</i> —Ozark Chinquapin	8
<i>C. pumila</i> —Chinquapin	32
<i>C. sativa</i> —Spanish Chestnut	70
<i>C. Seguinii</i> —Chinese Dwarf Chinquapin	16
"S8" (<i>C. crenata</i> × <i>C. pumila</i>) (U.S.D.A.)	2
"S8" (from close pollination)	3
<i>C. crenata</i> (Minturn) (from close pollination)	1
<i>C. crenata</i> × <i>C. dentata</i>	79
<i>C. crenata</i> (Forest Type) × <i>C. dentata</i>	3
<i>C. crenata</i> × "S8"	7
<i>C. crenata</i> (Forest Type) × <i>C. Seguinii</i>	1
<i>C. crenata</i> × (<i>C. crenata</i> × <i>C. dentata</i>)	3
(<i>C. crenata</i> × <i>C. dentata</i>) × <i>C. crenata</i>	1
(<i>C. crenata</i> × <i>C. dentata</i>) × <i>C. dentata</i>	4

<i>(C. crenata</i> × <i>C. dentata</i>) × <i>C. Seguinii</i>	1
<i>(C. crenata</i> × <i>C. dentata</i>) × (<i>C. crenata</i> × <i>C. dentata</i>).....	61
<i>C. dentata</i> × <i>C. mollissima</i>	12
<i>C. dentata</i> × "S8".....	13
<i>C. mollissima</i> × <i>C. crenata</i> (U.S.D.A.).....	4
<i>C. mollissima</i> × <i>C. dentata</i>	10
<i>C. mollissima</i> var. Mammoth × <i>C. dentata</i>	12
<i>C. mollissima</i> × <i>C. Seguinii</i>	4
<i>C. mollissima</i> × (<i>C. crenata</i> × <i>C. dentata</i>).....	2
<i>C. mollissima</i> × "S8".....	5
<i>C. mollissima</i> (from close pollination).....	1
(<i>C. mollissima</i> × <i>C. pumila</i>) × <i>C. dentata</i>	8
"S8" × <i>C. crenata</i>	13
"S8" × <i>C. dentata</i>	17
"S8" × <i>C. mollissima</i>	4
"S8" × (<i>C. crenata</i> × <i>C. dentata</i>).....	4
Seedlings from "open pollinations": Hamden (approximately).....	100
Total.....	755

Respectfully submitted,

ARTHUR H. GRAVES,
Curator of Public Instruction.

SYSTEMATIC BOTANY

The Classification of Dicotyledons

BY ALFRED GUNDERSEN

Flower Structures.—During 1937 studies and drawings of flower structures have been continued. Miss Purdy, staff artist, also completed a few detailed paintings. A photostat copy of the illustrations of Payer's *Organogenie comparée de la fleur*, published in 1857, was made. These valuable illustrations are now available in our library. Payer's illustrations bring out what is not clearly brought out by his text, namely the change, during the development of the flower, from parietal to axile placentation—in other words, a change from separate placentae to united placentae.

It is now widely accepted that leaves, such as fern fronds and leaves of flowering plants, represent flattened and fused stems. Briefly, a clubmoss is a primitive fern. Likewise, it is now generally considered that from carpels-separate to carpels-

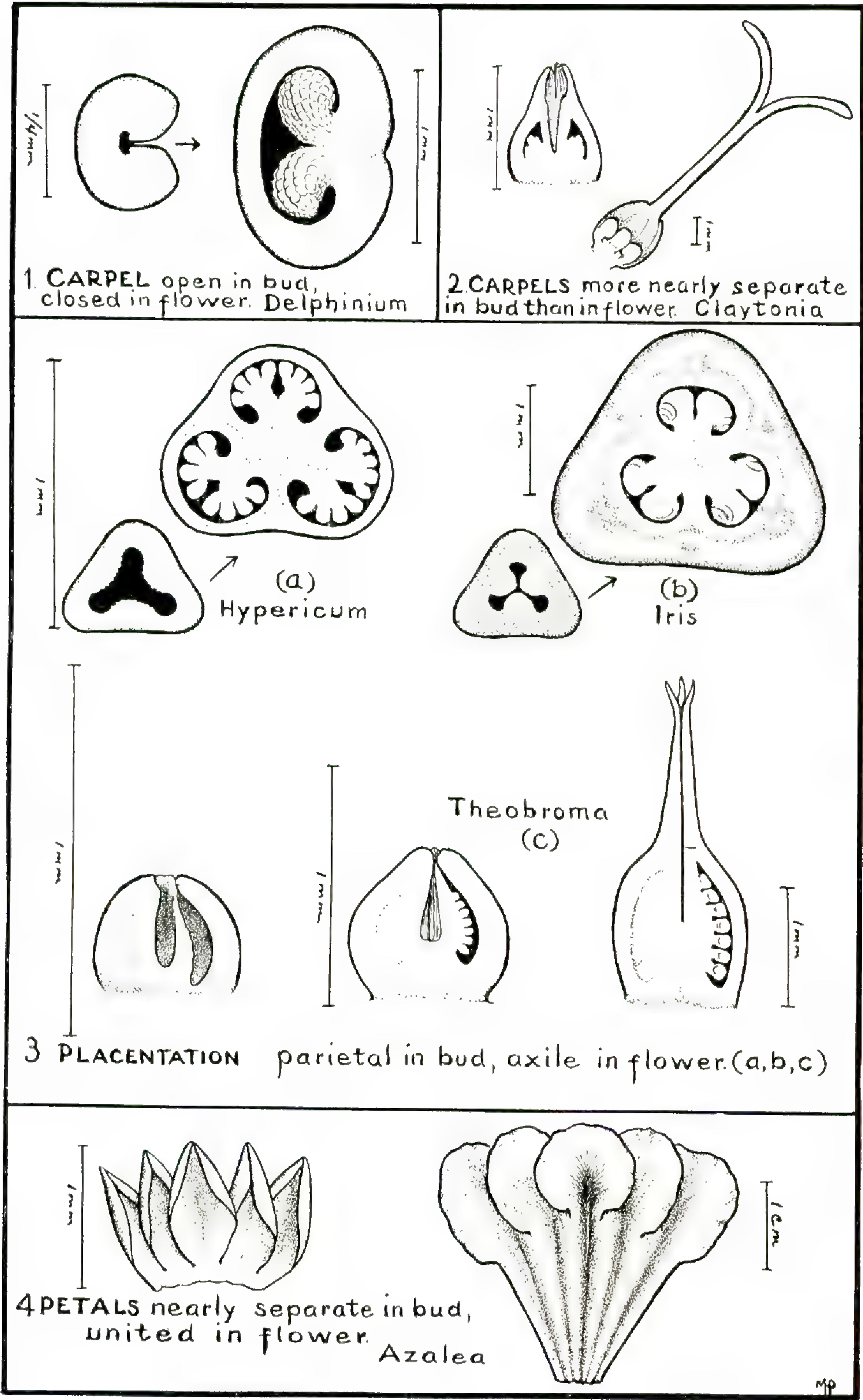


FIG. 5. Morphology of flower buds of various species compared with that of adult flowers, the buds showing primitive characteristics.

united has been the course of evolution, thus *Magnolia* precedes *Dianthus*. Further, it has long been recognized that from petals- or sepals-separate to petals- or sepals-united is the direction of change; Polypetalae precede Sympetalae. In other words, the union of parts is a very important principle in varied aspects of plant evolution.

Separate placentae (that is, parietal placentation) to united placentae (that is, axile placentation) is then only a part of a broad general principle. It has been suggested that the phrase "ontogeny recapitulates phylogeny" should be changed to "ontogeny throws light on phylogeny." Similarly, understanding the development of placentation throws light on the classification of flowering plants. Three stages are suggested: (1) Families having carpels separate or single: *Magnolia*, *Rosa*, *Protea*; (2) Carpels united, but placentae separate: *Papaver*, *Cistus*, *Salix*, *Betula*; (3) Carpels united and placentae united: *Geranium*, *Hydrangea*, *Dianthus*, and nearly all Sympetalae. In plants, as in animals, improved placentation means more effective nourishment of the next generation.

The question arises as to what extent is it justifiable to apply placentation as a main principle in the classification of flowering plants. A minimum would be the bringing together the *Cistus* and *Papaver* groups. This is in fact done in the Bentham and Hooker, Eichler, Warming, Wettstein, Rendle, and Hutchinson systems. Their separation in the Engler system must be considered as a mistake. It is still a question along what different lines change in placentation may have occurred. Further, to what extent do these ideas conform with paleobotanical evidence? I believe they are not contradicted by them.

SYSTEMATIC BOTANY

Eleocharis: Galapagos Islands: Local Flora

BY HENRY K. SVENSON

In addition to executive work of the department during 1937, I continued studies in the *Cyperaceae*, chiefly in the genus *Eleocharis*. My visit to European herbaria during the summer

enabled me to see most of the type specimens which I had previously been unable to interpret, so that I definitely expect to complete my study of the group, which has extended over a period of years, in the coming spring months. Material of these plants has been received in large quantities for identification from various universities and individuals.

A treatment of the ferns of the Galapagos Islands and Cocos Islands has been completed. For some time I have been engaged in a study of the plants of Middle Tennessee, an area which will soon be greatly changed from the wild-life point of view by the industrial developments now going on in that region. In addition the vegetation of Long Island and of the vicinity of New York are being worked on from time to time.

ECONOMIC PLANTS

BY RALPH H. CHENEY

1. *Comparative Caffeine and Coffee Pharmacology*.—Previous studies of the effect of the alkaloid and the beverage upon the small intestine were extended to an investigation of their effects upon the mammalian colon. The summer work was conducted at the Marine Biological Laboratory, Woods Hole, Massachusetts.

2. A taxonomic study and an investigation of the flavor qualities of the native beverages of North America was begun.

REPORT OF THE CURATOR OF PUBLIC INSTRUCTION FOR 1937

DR. C. STUART GAGER, DIRECTOR:

Sir: I submit herewith the report of the work of this department for the year 1937.

ATTENDANCE AT THE GARDEN

Entrance Gates.—The figure for the total attendance at the Garden during 1937—1,691,835—entirely justifies our analysis in the report for 1936. It will be recalled that there was a

decrease of some 50,000 odd in 1936 below the year 1935. We believed that in reality the figure for 1936—1,567,304—represented a slight increase, since the figure for 1935—1,624,865—was abnormally large on account of publicity resulting from the celebration of the 25th anniversary of the founding of the Garden. If there had been a regular increase of about 8% each year since 1934, the figure would stand about as at present.

Week-end Records.—The largest week-end attendance ever recorded in the history of the Garden, approximately 48,000, occurred on May 8 and 9, during the height of the Japanese cherry blossom season. This number is considerably in excess of the previous record for week-end attendance, 43,416, in 1935.

Monthly Records.—Record attendances were attained for the months of February, April, May, June, September, November and December. How these records compare with the largest previous figures is shown in the following table.

1937	Attendance	Largest previous attendance	Year
February	79,825	71,339	1932
April	223,175	205,410	1933
May	346,871	260,312	1936
June	183,765	182,916	1935
September	154,295	154,022	1935
November	114,090	96,987	1936
December	70,078	57,538	1928

Attention is called to the high record of May—the largest attendance for any month in the history of the Garden. The figure is much larger than that for the *whole year* of 1916—314,990—when attendance records began to be kept. The high record of December probably reflects the mild temperature combined with the fair weather of that month.

Attendance at Conservatories.—On account of extensive repairs to the foundations and superstructure, the Conservatories were closed to the public during the last half of January and up to and including the first half of September. The total attendance for the year is therefore small.

Attendance at Classes and Lectures.—The combined attendance

at classes and lectures held at the Garden was 129,929, as against 149,942 of last year.

ATTENDANCE AT THE GARDEN DURING 1937

	Jan.	Feb.	Mar.	Apr.	May	June	July
At regular classes....	1,153	1,240	2,670	4,266	3,718	2,585	14,000
At visiting classes...	273	1,136	2,546	5,733	19,547	6,090	700
At lectures to children.....	173	636	1,500	3,721	10,967	2,191	630
At lectures to adults....	0	12	60	0	522	227	70
At conservatories....	2,436*	0	0	0	0	0	0
At grounds.....	54,531	79,825	96,044	223,175	346,871	183,765	162,462
	Aug.	Sept.	Oct.	Nov.	Dec.	Annual Totals	
At regular classes.....	9,600	5,177	2,257	2,413	2,075	51,154	
At visiting classes.....	0	220	8,943	4,044	1,982	51,214	
At lectures to children...	0	125	2,402	3,291	891	26,527	
At lectures to adults....	0	75	168	0	50	1,034	
At conservatories.....	0	4,000†	12,507	9,582	7,290	35,815	
At grounds.....	112,895	154,295	93,804	114,090	70,078	1,691,835	

* $\frac{1}{2}$ month; conservatories closed for repairs.

† Estimate; open about 2 weeks.

ADULT COURSES

New Courses Offered in 1937.—A new course in “Flower Arrangement” offered in January, was held in 4 sessions, at which Mrs. Yoneo Arai, Mrs. Ernest Frederick Eidlitz, Mrs. Roy M. Lincoln, Mrs. Ronald Hart, Mr. Philip H. Pratt and Mrs. Henry J. Davenport spoke and demonstrated. This course was in addition to the regular course in Flower Arrangement offered the previous fall by Mrs. Whitney Merrill.

“Special Horticultural Groups,” an advanced garden course designed especially for members, was given on Fridays in May and June, the object being to acquaint the class with the botanical and cultural characteristics of various attractive plant displays in the Garden at the height of their blooming period. Dr. Reed, Mr. Free, Dr. Gundersen, and Mr. Doney were the instructors.

The name of course A32, “The Structure and Evolution of Flowers” given by Dr. Gundersen was changed to “Herbaceous Plants.”

“Botany in your Garden” is the title of a new course conducted by Dr. Svenson in the fall. This course, designed to assist the amateur gardener, dealt with the more important fundamental processes which have a rôle in the life and growth of plants.

Other Courses.—For the eleventh consecutive year I conducted a course for nurses-in-training. The registration was the largest on record. Fifty-one young women registered in the spring from Kings County Hospital and 130 in the fall from Kings County, Prospect Heights, St. John’s, and St. Mary’s Hospitals. This was the first year that the last named institution has sent students to us. The total registration of nurse students—181—shows a great increase over the number in 1936—118. Beginning in 1927, when we had less than a dozen students, these hospitals, at their own request, have sent students to us and have come to regard the course, which deals especially with medicinal plants and botany in relation to *materia medica*, as a regular feature of their curriculum.

As usual, Miss Vilkomerson and I gave the outdoor course in trees and shrubs of Greater New York in the spring and fall, with registrations of 55 and 17 people, respectively.

During the first half of the year Miss Rusk continued to have charge of the classes begun the previous fall: general botany, flowering plants, and genetics. For six weeks, both in the spring and in the fall, she conducted a field course on the wild flowers of the New York region. During the fall she gave also a laboratory course in flowering plants.

In all, 802 were enrolled in Botanic Garden courses for adults during the year. This is a marked decrease from the registration of the year before—973—and, were it not for our large registration of nurse students—181—there would have been a much more spectacular drop. This may be explained in part by changes, of experimental nature, in our method of circularization of the courses. It seems clear from the results obtained that drastic economy in circularization (which was one of the changes) is not a good policy—not really an economy. A return to our former system, which had been built up carefully through the years, is recommended.

STATISTICS OF SCHOOL SERVICE

1937

Loan Lectures (Lantern Slides, etc.)

No. of sets lent	30
No. of teachers involved	186
No. of pupils attending	13,646

Material Supplied

Total number of requests from schools	690
Number of different institutions	214

High Schools and H. S. Annexes

Brooklyn (Total No. 41)	25
Queens (Total No. 25)	10
Manhattan (Total No. 34)	14
Other Boroughs (Total No. 25)	10

Junior High Schools (Total in Brooklyn 25)	7
--	---

Colleges and Universities (Total in Brooklyn 7)	11
---	----

Elementary Schools

Brooklyn (Total No. 231)	78
Queens (Total No. 155)	9
Manhattan (Total No. 141)	2
Other Boroughs (Total No. 148)	4

Private and Parochial Schools	15
---	----

Other Institutions	25
------------------------------	----

Number of potted plants for nature study	1,600
--	-------

Number of Petri dishes filled with sterilized agar	1,342
--	-------

Total number of teachers supplied with material	3,762
---	-------

Total number of pupils reached	177,404
--	---------

Living Plants Placed in School Rooms

No. of schools	30
--------------------------	----

No. of plants	353
-------------------------	-----

No. of teachers involved	642
------------------------------------	-----

No. of pupils reached	22,666
---------------------------------	--------

<i>Plants Distributed (Raised in Classes)</i>	36,717
---	--------

No. of persons taking plants	908
--	-----

Total number of schools represented	164
---	-----

Seed Packets for Children

No. of schools	463
--------------------------	-----

No. of teachers	7,663
---------------------------	-------

No. of pupils	305,114
-------------------------	---------

No. of packets	915,343
--------------------------	---------

Exhibits Provided

No. of exhibits	3
---------------------------	---

Viewed by	138,200
---------------------	---------

FLOWER DAYS

The details of the four flower days held in 1937 are presented herewith:

Tuesday, April 27. Daffodil Day. Leader: Mr. James G. Esson, Vice-President of the Long Island Horticultural Society. Topic: Daffodils.

Tuesday, June 8. Tenth Annual Rose Garden Day. Leader: Mr. S. R. Tilley, Rose Grower, Brooklyn Botanic Garden. Topic: Through the Year with the Roses.

Wednesday, October 13. Fall Rose Garden Day. Leader: Mr. S. R. Tilley. Topic: Symposium in the Rose Garden.

Tuesday, October 26. Chrysanthemum Day. Leader: Mr. G. H. Gillies, Head Gardener for Mr. Marshall Field, Huntington, L. I. Topic: Chrysanthemums.

At the fall Rose Garden Day the usual formal lecture was omitted. The members of the Garden and their guests were conducted to the Rose Garden, where Mr. Tilley, using the living plants as demonstrations, answered questions "from the house" on rose growing.

I am glad to have this opportunity of expressing our appreciation of the splendid cooperation of the Woman's Auxiliary in conducting the teas at these events. The attendance at the flower days has steadily increased from year to year, and a large share of the credit for their popularity should go to the Woman's Auxiliary.

"EXHIBIT OF THE WEEK"

Obviously it is impossible for a visitor to comprehend, or even to notice, all of the interesting and unusual features of the Garden in one visit. Especially is this true of the living exhibits, where changes, such as flowering, fruiting, autumnal coloring, etc., are occurring from day to day. Therefore, an outdoor movable bulletin board was constructed, to be temporarily located near the feature to which attention is being directed. A large placard, mounted thereon, explains the "Exhibit of the Week" (Fig. 6). Three of the placards read as follows. The Poinsettias (about 20 ft. high) were in the conservatories.



FIG. 6. "Exhibit of the Week" label at the Smoke Tree (*Cotinus coggygia*), June 16. (9436)

*Exhibit of the Week**Poinsettia**Euphorbia pulcherrima*

The bright red "flowers" that make poinsettias so popular for Christmas decorations are not really flowers at all. The flowers are in the small green and yellow structures at the center. They have no petals, but the showy red leaves make up for this lack.

The poinsettia grows wild in Mexico and Central America. It is also called Lobster Flower, or Mexican Flame-leaf.

*Exhibit of the Week**Poet's Narcissus*

Do you know the difference between a Daffodil, a Narcissus, and a Jonquil?

The DAFFODIL has a deep crown, or long "trumpet," and flat, ribbon-like leaves.

The NARCISSUS has a shallow crown, and flat, ribbon-like leaves.

The JONQUIL has a shallow crown, and round, rush-like leaves.

Botanically, they all are kinds of *Narcissus*.

Exhibit of the Week

This Austrian Pine tree is in full bloom.

Here is a cluster of male flowers. (*Specimen fastened here.*)

Tap a branch lightly, and see the cloud of yellow pollen that is shed.

These are two female flowers. (*Specimen fastened here.*)

They develop into woody cones, which are the "fruit" of the pine tree. Each pine cone contains many little winged seeds.

Below this is the following statement:

"The Brooklyn Botanic Garden contains many interesting plants which might be overlooked in the midst of the more striking floral displays. In order to bring these to the attention of visitors, one such exhibit will be featured each week. Items of general interest will alternate with those of special value to amateur gardeners."

This latest educational feature of the Garden was under the supervision of Miss Hilda Vilkomerson, who is also responsible for the original conception of the plan. From the beginning it was a complete success, if we are to judge by the number of people—on Sundays or holidays sometimes ten deep—reading or copying the item or copying the pictures which were often pre-

sented. The following list of subjects, selected from among those displayed, gives a fairly comprehensive idea of the exhibits through the year:

- April 14–20. Flowering of the Elms.
- April 20–27. An unusual shrub from Japan. (Corylopsis)
- April 27–May 1. Poet's Narcissus. (Explaining the differences between the Daffodil, the Narcissus, and the Jonquil)
- May 11–18. The Trifoliate Orange.
- May 18–25. The Japanese Walnut in Flower.
- May 25–June 1. The Austrian Pine in Flower.
- June 10–20. Poison Ivy, Poison Sumac, Woodbine.
- August 17–31. The Royal Water Lily.
- September 1–10. The Smoke Tree.
- October 12–19. The Hop Vine.
- October 26–November 2. The Witch Hazel.
- December 7–14. The Poinsettia. (Conservatory exhibit.)

It is recommended that in view of the very evident popularity and real service that this device is rendering, a small sum be appropriated for the construction of a more dignified and durable structure.

PUBLICITY AND EDITORIAL WORK

During the year we continued the program we have followed for more than 16 years, of sending from time to time to the metropolitan newspapers, various horticultural journals, and other interested agencies, news releases concerning our courses, lectures, flower displays, rare plants in bloom, or any item of general public interest regarding the Garden's plantations or the activities of the Garden's personnel. As evidence of the publicity thus secured, we have received this year from our clipping bureau 1,082 clippings as against 1,398 in 1936.

Programs of the radio broadcasts to be made by members of our staff from January to June inclusive, were prepared, printed, and issued in January, and similar programs for the remainder of the year were issued in October. Circulars descriptive of our courses were prepared and sent to garden magazines in March as well as to the *Teaching Biologist*, the organ of the New York Biology Teachers Association. The annual *Prospectus* of these

courses, which appeared as No. 4 of Volume 26 of the Brooklyn Botanic Garden *Record*, was prepared in June and July.

I have continued to serve as Editor of the Plant Section of General Biology for *Biological Abstracts* and, as usual, have had general editorial supervision of the *Contributions* of the Garden.

ACTIVITIES OF OTHER DEPARTMENT MEMBERS

In July Miss Rusk was a member of the faculty of the Summer Garden Institute at Rogers Rock, Lake George, giving lectures, field trips, and informal conferences for and with the 40 or 50 Garden Club members attending from eight or nine states. From May 15 to November 1 Miss Rusk cooperated with Dr. Max Harten of the Jewish Hospital, Brooklyn, in his hay fever studies, by exposing sterile slides each day to catch pollen.

In the early spring Miss Vilkomerson made a study of the aquatics in our conservatories, and made recommendations as to arrangement, labelling, substrata, maintenance, and desirable plant species for culture. During her vacation, in the latter part of June and the first half of July, she studied flower behavior in the various species and hybrids of chestnut at the plantations at Hamden, Conn. A report of this work will be submitted in January, 1938, in partial fulfillment of the requirements for the degree of Master of Arts at Columbia University.

MISCELLANEOUS ITEMS

Membership Committee.—In November I was appointed the Botanic Garden representative of a committee for the promotion of membership in the Brooklyn Institute of Arts and Sciences.

Boy Scout Examinations.—As in previous years, acting as special examiner for boy scouts, I held examinations in February and March for merit badges in forestry and botany.

Research Projects.—For a committee of the New York Biology Teachers Association, I prepared, in May, a list of projects in botany suitable for research by members of the Association.

Rare Woods Sent to Yale.—As during several years past, in January and February sections of trunks of *Pandanus utilis*, *Mangifera indica*, and *Blighia sapida* were sent to enrich the collection of woods of which Professor Samuel J. Record is in charge, at the Yale School of Forestry.

Exhibits.—Specimens of drug plants were lent in May to Mr. J. Bilik, druggist at Coney Island, for an exhibit in his store window held in connection with a special project in pharmacognosy in the Biology classes of Abraham Lincoln High School.—Specimens were also furnished for an exhibit at the Queens County Medical Society during “Children’s Health Week” beginning May 2.

Bird Lists.—The Brooklyn Bird Club, through Mr. Bernard P. Brennan, has continued to send us lists of birds seen at the Garden, and these lists have been posted on our bulletin boards each week in the spring and autumn—more irregularly through the winter and summer months.

Nominating Committees.—In December, I served on the nominating committees of the American Fern Society and of the Torrey Botanical Club to prepare a list of persons to be voted on as officers of these organizations for the ensuing year.

Chestnut Research.—Part of June and September, and all of July and August, I spent at our chestnut plantations at Hamden, Conn., where we are raising new types of trees to replace the now practically defunct American chestnut. A report of this work will be found on pp. 44–55.

Cooperation with the Department of Education.—On March 3, the Department of Botany of the Department of Education, Brooklyn Institute, met at the Laboratory Building of the Garden. Mr. Charles Ericson spoke on “Ferns and Fern Allies.” The Department held its annual social meeting at the Garden, as usual, on October 19.

Bureau of Information.—Answering questions about plants by telephone or letter, or as a result of personal interviews, giving advice on courses, books, programs of study, sometimes personal visits to nearby properties, etc., consume an amount of time much disproportionate to the emphasis apparently indicated by this brief note.

NEEDS

In the annual reports I have submitted since I reported for duty at the Garden in September, 1921, the question of needs has rarely been mentioned up to the present, the seventeenth report. A survey of the reports through these years shows how our work has increased from year to year, an inevitable result of

increasing publicity and natural growth. And yet, in spite of this, I regret to say, the funds for some of our activities have actually *decreased*. I shall name three of these activities in the order of their importance from the standpoint of the Garden.

1. *Public Lectures*.—In 1924, nine free public lectures were given at the Garden, but in the 13 years that have followed there has been none. Their place has been taken by the lectures given at “Flower Days” (open only to members and their friends), and by occasional “benefit” lectures sponsored by the Woman’s Auxiliary. I believe that with the greatly increased interest not only in the Botanic Garden itself, but in gardening and plant life in general, a resumption of popular *free* lectures would meet with an enthusiastic public response. From this point of view it would seem an opportunity for public service that we should no longer neglect. I recommend, therefore, that a small sum be set aside annually for such free, public lectures, including motion picture demonstrations.

2. *Loan Lectures*.—In 1924 we offered 5 loan lecture sets to the schools. This number was increased to 6 in 1930–31, as follows: 1. Plant Life; 2. Spring Wild Flowers; 3. Common Trees; 4. Fall Wild Flowers; 5. Forestry; 6. Conservation of Native Plants.

The collection of slides illustrating each subject is accompanied by a lecture text, and the series has been much used by school teachers. I feel, however, that the number of subjects could and should be greatly increased, in order to use to the fullest extent our opportunities for service. A small amount should be set aside each year for the preparation of additional loan sets, dealing with new subjects.

Leaflets.—During this last year the publication of the Brooklyn Botanic Garden *Leaflets* was temporarily discontinued. They had been issued for 24 consecutive years, beginning in 1913. That these *Leaflets*, dealing with popular information on plant life, filled a need, the hundreds of requests we received each year, not only from New York, but from the country at large, testify. We are still receiving these requests. In this case again, I feel strongly that we are losing ground on our public service record by giving up this valuable educational asset. I recommend, therefore, the appropriation of a sum for the resumption of the

Leaflets—not in their old form, which had become outmoded, but in a new, attractive dress, well supplied with illustrations and figures.

These are by no means the only desiderata in this department, but the three points outlined represent the most urgent needs from the standpoint of public service.

Respectfully submitted,

ARTHUR HARMOUNT GRAVES,
Curator of Public Instruction.

REPORT OF THE CURATOR OF ELEMENTARY INSTRUCTION FOR 1937

DR. C. STUART GAGER, DIRECTOR.

Sir: I hereby present the annual report of the Department of Elementary Instruction for the year 1937.

Personnel.—Early in the spring, Miss Natalie Hettger, a teacher from Hasbrouck Heights, N. J., studying at Columbia University, came to us twice a week for experience in greenhouse work. Edward Johnson was appointed as an assistant in our outdoor garden for the months of July and August in a regular teaching position. On October 1, Miss Frances M. Miner was given a year's leave of absence to work with the National Recreation Association on a survey of children's garden work in this country. Miss Michalena L. Carroll stayed on as her substitute. Because of heavy registration in our fall classes, four of our former students became paid assistants on Saturday mornings. They were Edward Johnson, Mary McArdle, Patricia Spollen, and Sidney Wiesner.

The various phases of our work have gone on as usual.

Visiting Classes.—Our visiting classes have increased in the number of sessions, but the attendance figure has remained practically the same. This is due to the fact that we have worked with smaller groups as far as possible. There have been two unusually interesting features of our visiting class work this year. One was the W. P. A. educational project of the Staten Island schools through which classes have been brought over here by bus. These have been among our most satisfactory groups, in

work accomplished, in behavior, and in appreciation. The second was the small group of blind and partially blind children from P. S. 77, Queens, who spent a full morning here, and under the guidance of Miss Carroll, were able to come in personal and close contact with flower and plant forms, and thus acquire some knowledge of such Gardens as ours. Another interesting feature to note was the visits of the Garden Club of P. S. 9. Delegates from different groups of the upper grades came once a week to learn how to take care of their school plants, both those in pots and those in window boxes. This project has been most satisfactory to us and to the school.

Adult Classes.—There has been added to our regular classes this year a fall class in Plant Propagation. This was given jointly by Miss Dorward and myself, but largely by Miss Dorward. Twenty-six members of our former classes in Fundamentals of Gardening made up the group. During the spring Miss Carroll gave a guest class to teachers of art in some of our elementary schools. This was an invitation class and had the approval of Miss Edith Nichols, Assistant Director of Art in the Public Schools.

Children's Garden.—The children's garden was conducted as usual, but with a larger number of children than in former years. Over 260 children were registered in the garden, the extra number making up for the attendance drop during the summer. This change is due to the fact that more children go to camps and summer homes than in the past.

Equipment.—During the year three cold frames placed between our greenhouses and the main range of houses have added to the efficiency with which we can handle and harden off the spring seedlings. The three instruction greenhouses do not give us enough space for our work, so Dr. Reed permitted us to place some of our plants in his greenhouses, where, under better conditions of temperature control, they came to a more successful flowering. A portion of the potting room set aside for the educational greenhouses has been partitioned off so that Miss Sutcliffe may have extra potting space. Three dozen new trowels have been bought for the children's greenhouses and the old ones assigned to the children's garden. Tampers, floats, and sieves are being made this winter by P. S. 90. We have received esti-

mates for a small lean-to greenhouse at the end of our range to be used as a propagating place, but these were too high to be considered, and hence the project has been set aside until a future time.

Outside Activities.—Many calls have come to us for outside help in connection with schools and other organizations. Among the important educational speeches of the year which I made was a talk on the Schoolmen's Week Program at the University of Pennsylvania, in Philadelphia. About three hundred teachers representing Eastern Pennsylvania attended this. Another talk was given before the Woman's College Club of York County, at York, Pennsylvania. During the spring I was called to a garden conference of the Federated Garden Clubs of the State of North Carolina to assist in a Junior Gardening project; in the fall I did a similar piece of work for the Garden Clubs of South Carolina and New Jersey. From June 17 through June 20 Miss Hammond conducted the nature work in a Camp Training Course for Counsellors and Directors given at Cold Spring, N. Y., under the auspices of the United Neighborhood Houses of New York City and the Children's Welfare Association. In August Miss Carroll attended, as instructor, a conference conducted by the State Department of Education at Blue Ridge Graduate College, Blue Ridge, N. C. Her course demonstrated the value of nature through art expression, and her work was based upon the work we do with children here at the Brooklyn Botanic Garden.

We have had a number of visitors from afield. I would mention particularly representatives of the Botanic Garden at Montreal, who came for assistance in planning their educational work for the future.

Preparation and Distribution of Material.—Besides the regular classwork with teachers and visiting classes, Miss Hammond has collected, pressed, mounted, and labelled 1206 specimens of 74 different kinds of flowering plants, having collected and done all the other work herself. I would call to your attention the fact that this Department has not only carried a heavy teaching schedule with visiting classes and adult classes, but packed over 1,000,000 packets of seed and sold over 915,000 of the same; managed three greenhouses (and distributed from these 40,000 plants); maintained the children's garden; distributed nature

material to over 2,000 teachers and over 90,000 pupils; and conducted the Saturday morning school of education for children, numbering over 700 in registration through the year.

City-wide Service.—It might be of special interest to the Board of Trustees to know that during this current year 92 per cent. of all our elementary schools in this Borough have been in touch with us in some phase of our work.

Consultations with Teachers.—Not only have all these regular avenues of work been followed, but a great deal of mechanical work that should be done by a staff of aids has been done entirely by members of the Department. In addition, the time taken by conferences is enormous. Miss Hammond alone has held over thirty nature conferences with teachers who came here for definite assistance on programs to be carried on in school work.

Besides writing the usual articles for *The Sun* (New York), I have given a greater number of educational talks than in any other year. The total number for the year was fifty-six, not including broadcasts. I still serve as Honorary Secretary of the National Plant and Flower Guild, as Vice-President of the New York Chapter of the American Nature Study Society, and as a member of the National Committee on Nature-Garden Clubs for the School Garden Association.

This report and accompanying figures may give some idea of the pyramiding of work during the past year, and should be called to your attention for future consideration.

Respectfully submitted,

ELLEN EDDY SHAW,
Curator of Elementary Instruction.

REPORT OF THE CURATOR OF PLANTS FOR 1937

DR. C. STUART GAGER, DIRECTOR.

Sir: I herewith respectfully submit my report for the year 1937.

CONIFERS

The even, moist climate of the Pacific Coast and of western Europe make ideal conditions for a large number of conifers.

A smaller number of species thrive under drier, usually northern climates. In a Report of the Interstate Park Commission it is stated that conifers in general have not succeeded well in the Bear Mountain region of New York, hot summers and absence of snow cover in winter being in general unfavorable to these plants. Nevertheless a number of collections exist in the New York region, where many species of conifers have succeeded. Even under our city conditions a number of species have grown well, in particular eight or ten species of pine, also Atlas cedar, Serbian spruce, Nikko fir, junipers, and Japanese yew.

In the spring, with Dr. and Mrs. Reed and Mr. Caparn, I visited the Montgomery collection of conifers at Coscob, Connecticut. What especially interested me was the growing of conifers between large oaks, giving partial protection from sun and wind. A gift of conifers was made by the Princeton Nurseries, and a number of small plants have been assembled in our nursery. Somewhat revised plans for our conifers have been made with the expectation that our collection may be considerably increased, even though this may mean occasional replacement of certain species.

LILACS

The identification of our lilacs is now in approximate order. Carefully prepared maps and records have been made by Mr. Emil Barens, W. P. A. worker. I have given attention to the classification of varieties, in particular to making a key to *Syringa vulgaris* varieties, of which we now have about one hundred and fifty. We have about sixteen species of lilacs; about twenty varieties and hybrids of lilac species other than *Syringa vulgaris*. I again visited repeatedly the Havemeyer collections. The size and shape of clusters, their density, the size of flowers, are characteristics of greater permanence than color. These have been utilized in the following classification, intended to be an improvement on the one printed here two years ago.

<i>Syringa vulgaris</i> varieties		
Singles		Doubles
	White	
Alba virginalis Group (flowers small)		Edith Cavell Group (cluster open)
Vestale Group (flowers large)		Jeanne d'Arc Group (cluster dense)

Pink	
Macrostachya Group (cluster open)	Waldeck-Rousseau Group (cluster open)
Christophe Colomb Group (cluster dense)	Charles Sargent Group (cluster dense)
	Emil Liebig Group (cluster small)
Reddish	
Charles X Group (cluster medium)	Charles Joly Group (dark)
Reaumur Group (cluster large)	
Rochambeau Group (flowers extra large)	
Bluish	
Bleuatre Group (dark)	Emil Gentil Group
Ronsard Group (light)	

MOSS RAVINE

During the winter of 1936-37 the construction of the shady moss ravine was completed. In the spring about twenty-five species of mosses, liverworts, and lichens were gradually planted and labeled. During the summer several of these died out. Among those that have become fairly well established are *Mosses*: *Polytrichum*, *Pogonatum*, *Leucobryum*, *Dicranum*, *Anomodon*, and *Bartramia*. *Webera*, *Climacium*, *Mnium*, *Thuidium*, and *Sphagnum* died. *Liverworts*: *Conocephalum*; all others died. *Lichens*: *Baeomyces* and two species of *Cladonia* were in good condition in the fall.

PLANTINGS

Mr. C. F. Doney, assistant in woody plants, reports that about two hundred plants were moved from the nursery to the grounds. Of these, seventy were additional new species in the Systematic Section. Some new genera, as *Aphananthe*, *Fortunearia*, and *Ehretia*, were added to the grounds. In the north section of the Garden supplementary groups of *Viburnum* and *Berberis* were made. Collections of horticultural varieties of *Philadelphus*, *Weigela*, and *Hibiscus* were started on the reservoir embankment.

About sixty-five photographs of woody plants in flower were taken by Mr. Buhle; many of these will be used for colored slides.

Progress was made, with the assistance of Mrs. Putz, in obtaining a greater variety of herbaceous plants. The absence of

anything like a manual for cultivated herbaceous plants has been a “long felt want.”

LABELS

Numerous new suspended labels were put out. These very cheap labels have proved fairly satisfactory, and are easily replaced when lost.

OUTDOOR CLASSES

In the spring I gave, for a second season, a course of four lessons on Lilacs, and also a new course, of ten lessons, on Herbaceous Plants. In the fall I gave eight lessons on Evergreens. Mr. Doney repeated his course on Ornamental Shrubs, ten lessons in the spring, ten in the fall.

MAP OF THE GARDEN

A map of the Systematic Section of the Garden, from the Lake and south, was printed ten years ago. During the past year, with W. P. A. assistance, and with the cooperation of Mr. Caparn, a combination map and picture map of the entire Garden has been completed for the first time.

STATISTICS RELATING TO LIVING PLANTS

	Species or Varieties	Plants
<i>Living Plants Received:</i>		
By collection	8	9
By exchange	178	288
By gift	992	3,767
By purchase	240	335
Total	1,418	4,399
<i>Living Plants Distributed:</i>		
To members		5,462
By gift (to public institutions)		330
By exchange		2,346
Total		8,138

IRIS COLLECTIONS

(Reported by Dr. George M. Reed)

Bearded Iris

<i>Received by Exchange:</i>		
Mrs. Thomas Nesmith, Fairmont Iris Gardens, Lowell, Mass.	25 varieties	
Mr. Fred W. Smith, Granogue, Del.	38	“
Total	61 varieties	

Japanese Iris

Received by Exchange:

Mr. H. C. Bland, Sumter, S. C.	1 variety
Flowerfield Bulb Farm, Flowerfield, L. I.	15 varieties
John Scheepers, Inc., New York City	11 "
<hr/>	
Total	27 varieties

Miscellaneous Iris

Received by Exchange:

Mr. W. Herbert Dole, West Orange, N. J.	3 species
Dr. R. A. Harper, Ridgewood, N. J.	2 "
Mr. Robert Wayman, Bayside, L. I.	1 " (9 var.)
Mrs. C. R. Wharton, Houston, Texas	1 "

SEED EXCHANGE

Seed Packets Received:

By collection	111	
By exchange	1,280	
By gift	50	
By purchase	1	1,442
<hr/>		
Total		1,442

Seed Packets Distributed:

By exchange	1,683	
To members	511	2,194
<hr/>		
Total		2,194

LABELS AND SIGNS

Labels and signs were made by Mr. John McCallum as follows:

Small galvanized labels for herbaceous beds	81
Lead labels for woody plants	86
Lead labels for the conservatory plants	92
Small wood labels for roses, iris, etc.	597
Large wood labels	46
Wooden signs	54
Cardboard signs	230
Twelve inch wood labels for special plantings	180
Wooden hanging labels for woody plants	181
<hr/>	
Total	1,547

Also numerous miscellaneous numbers and signs.

Respectfully submitted,

ALFRED GUNDERSEN,
Curator of Plants.

REPORT OF THE HORTICULTURIST FOR 1937

DR. C. STUART GAGER, DIRECTOR.

Sir: I submit herewith my report for the year ending December 31, 1937.

PERSONNEL

The regular force of gardeners was the same as in 1936. The daily average number of laborers was 13 as compared with 13.25 in 1936.

*Labor paid for by Government Relief Organizations**Works Progress Administration*

Outside guards

(gates and patrol)	2,010 days	12,060 hours
Handymen	380 days	2,280 hours
Technicians	230 days	1,380 hours

SYSTEMATIC SECTION

Three beds formerly occupied by Iris were planted with Gladiolus—1,025 corms in 41 varieties, the gift of John Scheepers, Inc., New York, and 625 corms in 25 varieties, the gift of the Stumpp & Walter Company, New York.

The Canna beds were enriched by a collection of 36 varieties (20 of each) donated by Henry A. Dreer, Philadelphia.

The Lespedeza hedge was moved south about 20 feet to provide more room for shrubs in the Leguminosae Family. The herbaceous beds in the adjacent Order, Geraniales, were adjusted to correspond with the change.

HORTICULTURAL SECTION

About 1,600 plants (162 obtained by purchase) were added to the wall garden.

The collection of trees and shrubs was enriched by the addition of 134 specimens in 84 varieties from our nursery. Forty viburnums in 18 species and 26 barberries in 23 species were planted in an adjacent area.

ROSE GARDEN

Forty-five new varieties of roses (6 of each) were planted in March to replace discarded Hybrid Tea varieties. In addition,

97 roses were planted to fill out incomplete rows and to augment our collection of climbers. For the above roses we are indebted to Bobbink & Atkins, Rutherford, N. J. (218 plants); Jos. W. Vestal & Son, Little Rock, Arkansas (108 plants); and Jackson & Perkins, Newark, N. Y. (41 plants).

ROSE ARC

The Hybrid Tea beds were extended and 320 new roses were planted as follows: 80 Alice Harding, 80 Eclipse, 80 Signora, donated by Jackson & Perkins; 80 President Macia, donated by Bobbink & Atkins.

CONSERVATORIES

In order to allow space for shoring the roof of the Economic House, preparatory to installing four additional pillars for its support, it was necessary to remove almost all the plant material in its center. Many of the trees and shrubs had been in one position for twenty or more years. Because of their crowded condition it was impossible, in the case of some of them, to remove them with an adequate root system, and they failed to survive the ordeal of being "heeled in" for several months. They have been replaced in part with other economic plants which we had growing in pots, and arrangements have been made to obtain seeds of other utilitarian tropical plants, which will be raised and planted in the Economic House when they are large enough.

MEDICINAL AND CULINARY GARDEN

The beds were made and planted in the spring in accordance with the plans of the consulting landscape architect. More than 60 species and varieties of culinary herbs, and 115 species and varieties of trees, shrubs and herbaceous plants used in medicine were planted.

MISCELLANEOUS

The border along the experimental plot fence was planted with perennial asters, both tall (86 plants, 21 varieties), and the newer dwarf kinds (1,044 plants, 6 varieties).

The "moss ravine" was completed, irrigation pipe laid and six 1/4-inch spigots installed to keep some sections constantly moist.

Sixty Japanese yews (alternate plants taken from hedge in the Horticultural Section) were planted around the "ravine."

A walk was constructed around the south edge of the lake—280' x 8' with a cinder fill, and 140' x 5' of broken flagstones. Two flights of steps were constructed connecting this walk with the Boulder Hill walk.

The Overlook was extended to the west by the construction of a concrete wall, 62' 6" long, and of concrete platforms totaling 81' 6" x 5' 7". Iron posts and rails were set up and ten additional seats were installed.

About 300 cubic yards of sand, delivered to a WPA project on the Museum grounds and not used, were given to us and hauled into the Garden by our $\frac{3}{4}$ -ton truck.

Two new drains were constructed on the Esplanade to take care of excess surface water.

Three large birch trees infested with the bronze birch borer were removed and burned.

Much time was occupied in fighting Japanese beetles by spraying and hand picking.

INTERNATIONAL FLOWER SHOW EXHIBITS

For our exhibit of Xerophytes at the twenty-fourth International Flower Show, Grand Central Palace, New York, March 15–20, we were awarded a Gold Medal, a special award; and the Award of Merit of the Garden Club of America. For an exhibit of four plants of Devil's Tongue (*Amorphophallus Rivieri*) we received a special award.

SEED AND PLANT DISTRIBUTION

In connection with the International Seed Exchange, 1,683 packets of seeds were distributed to foreign and domestic botanic gardens and other institutions. We distributed 511 packets of seeds to members of the Botanic Garden.

Surplus plants of chrysanthemums and dwarf hardy asters totaling 5,462 were distributed to 273 members in May.

COURSES OF INSTRUCTION

I conducted the following "Courses for Members and the General Public" at the Botanic Garden:

Special Horticultural Groups. Two lectures in a course consisting of six lectures, by various members of the staff.

Plants in the Home: How to grow them. Five talks with demonstrations.

PERSONAL ACTIVITIES

I served on the Advisory Council for the course in Ornamental Horticulture given at the State Institute of Applied Agriculture, Farmingdale, Long Island.

I acted as a judge on March 15 at the International Flower Show for the Federated Garden Clubs of New York State, and for the Garden Club of America; on September 13 at the Flower Show of the Consolidated Edison Company; and on September 21 for the Great Neck Garden Club.

I served on the Board of Directors of the American Rock Garden Society.

I am serving on the Lily Committee of the American Horticultural Society.

Respectfully submitted,

MONTAGUE FREE,
Horticulturist and Head Gardener.

REPORT OF THE CURATOR OF THE HERBARIUM FOR 1937

DR. C. STUART GAGER, DIRECTOR.

Sir: Due to my absence in Europe during the summer months, the amount of material collected for the herbarium, and consequently for exchange with other institutions, was less than usual. The insertion of material into the herbarium has proceeded at the usual rate, but due to an infestation of insects, to which herbarium collections seem to have been especially prone during the past year, much time has been spent in treating specimens with mercury bichloride and in fumigating them with carbon bisulphide. The extent to which material has been received from other institutions and from individuals may be seen by consulting the statistics following my report.

EUROPEAN TRIP

In July, I left with Mrs. Svenson for Europe for a visit to various botanic gardens and also for the purpose of examining type material of sedges and other American plants preserved in European herbariums. Arriving in Sweden in the middle of July, a visit was immediately paid to Dr. Skottsberg and to the remarkable botanic garden which he has developed within the northwestern limits of the city of Gothenburg. In addition to the general features which one finds in botanic gardens, a ravine with century-old native trees has been preserved, together with the natural herbaceous vegetation. The remarkable rock garden, partly carved out of granite ledges, has extensive moraines with a real alpine character. From Gothenburg, the writer proceeded to Copenhagen, where through the kindness of Dr. Hagerup, he was allowed to examine the herbarium assembled in the late eighteenth century by the Danish botanist, Vahl, which contains many types of sedges that have been greatly misunderstood by later workers. The Botanic Garden, built around a lake and among old ramparts which once stood at the edge of the city, has a unique display of native plants in a setting of miniature sand dunes and bogs. An ingenious construction of small concrete and wire compartments jutting out into the lake, provides for the growth of aquatic plants, such as species of *Potamogeton* and *Ranunculus*, which are not ordinarily easy to grow. The extensive rock garden is especially rich in *Saxifraga*.

En route from Copenhagen to Stockholm, a visit was made to the birthplace of Linnaeus, which is now easily accessible by automobile. It is kept in good condition, serving both as a Linnaean Museum, and as a repository of antiques from the surrounding country, especially of old wooden household utensils. As in New England, much of the farm land of a century ago in this Linnaean countryside has grown up into woodland, and timber is now the greatest natural resource of the area. The groves of tall Norway spruce and Scotch pine, innumerable rock-bound lakes of irregular outline, and bogs whitened with acres of cotton grass (*Eriophorum*) make the district most interesting from a botanical and scenic point of view, and one feels that the landscape could not have changed greatly since the time of Linnaeus.

At Stockholm, the black-tiled brick buildings of the Natural History Museum and the Academy of Natural Sciences are architecturally attractive and the herbarium collections are exceptionally interesting, since they include an enormous assemblage of specimens from southern and eastern Brazil and from the mountains of East Africa, as well as a number of important 18th Century collections from America. Dr. Samuelsson, an authority on aquatic plants of northern Europe, was most helpful to me in locating important specimens of sedges. I also had the pleasure of meeting Dr. Hultén, of Lund University, who was visiting Stockholm; he is well known for his work on the plants of Kamtchatka, and is now describing the vegetation of Alaska. Just across the road from the museums is the botanic garden (Hortus Bergianus), founded in the 18th Century, by Bergius, a pupil of Linnaeus, and well known for the clipped hedges of ancient beech trees, and for the towering rock garden, exhibiting primarily the plants of western China.

North of Stockholm, an hour's ride by railway, lies the old university town of Uppsala. Here, in addition to the splendid cathedral and the completely restored Linnaean Garden, may be seen the botanic gardens which were started by Rudbeck in 1655, and which surrounded the botanical buildings of the university. Some plants are still present which were probably grown two hundred years ago by Linnaeus from seeds obtained in eastern America; among them I especially noted the purple Joe-Pye Weed (*Eupatorium purpureum*), which exists here in the type-form (*Eupatorium trifoliatum*) characteristic of the southern Alleghenies.

Proceeding to Berlin by way of the Trelleborg Ferry and the island of Rugen with its high chalk cliffs, I spent some time at the Royal Botanic Gardens and in the extensive herbarium which contains the Willdenow collection, including the types of many species described from Pennsylvania. To me the most impressive things in the Garden were the beautiful *Victoria regia* house, with its gigantic-leaved water-lilies in full bloom, and the rock garden with its replicas of geological formations with their associated plants, illustrating the various botanical regions of the Alps and Carpathians, a type of exhibition which does not seem to be ap-

proximated elsewhere. The plantations representing American forests and the pine-barren bogs of New Jersey were most interesting. To Dr. Diels and Dr. Pilger and all the members of the herbarium staff I am indebted for the great courtesy which was shown to me in my examination of the Willdenow and other herbarium collections.

At Paris I was given access to the interesting collections made by Michaux, one of the pioneer explorers of eastern America. These specimens are housed in the new building in the Jardin des Plantes, constructed by means of funds from the Rockefeller Foundation. Here I also investigated important collections from Brazil, Japan, and northern Africa. Outside in the garden, the ancient cedar trees, the small but interesting assemblage of rock plants, and the new vivarium are all of worth-while interest.

In London, I again visited the rooms of the Linnean Society where, with the help of Mr. Savage, I spent some time in looking up the original specimens which Linnaeus had obtained from eastern United States. The Linnaean herbarium is the most valuable collection of pressed plants in the world, and the utmost precautions are accordingly taken for its safety. At the British Museum of Natural History, I had the pleasure of looking through Walter's herbarium from South Carolina (circa 1780) and Plunket's herbarium (still older), and saw also the original specimens of *Eleocharis*, which Robert Brown described from Australia in 1810.

I spent a week on the coast of Cornwall, where the planted (and sometimes escaped) specimens of *Veronica* (*Hebe*), *Fuchsia*, *Cordyline*, and *Araucaria* frequently give an almost tropical aspect to the scenery, and where the display of heather and gorse is seen in unusual brilliance on the whitened china-clay moors north of St. Austell.

Returning to London in late August, I went from there to Dublin by way of Holy Head and the Irish Sea. The botanic garden at Glasnevin (Dublin), which it was my privilege to visit under the guidance of Mr. Besant, is one of the most attractive in Europe, and dates back to 1794. Nowhere have I seen such large redwoods and Araucarias, and nowhere was there a more brilliant display of Begonias and other colorful border plants. The green-

houses with their display of succulents and gourds, the collection of dwarf evergreens, and the rock garden itself were most fascinating. As in Cornwall, the hart's-tongue fern grows everywhere on shaded roadside banks and the wall-rue (*Asplenium Ruta-muraria*) is abundant on old stone walls around Dublin. Before catching the boat at Belfast, to arrive in New York about the middle of September, I had the opportunity of spending a short time in the small but attractive rock garden at Belfast, which has an exceptionally good display of *Erica*.

LOCAL FLORA SECTION

This area, containing only native plants of the New York region, has undergone but little obvious change in the past year, but the fact should be emphasized that in such developments much labor is often required to make a place look "natural." Such changes, not apparent to the casual visitor, are represented in the extension of the white-sand area half way to the boundary fence, giving an additional surface for the growth of *Hudsonia* and *Corema*, and providing a more natural background for the previous plantings. Furthermore, this additional sand will prevent the run-off of water from garden soil, carrying clay and humus to the detriment of the sand area below. White sand has also been placed around the plantings of trailing arbutus (*Epigaea repens*). A similar inconspicuous change has been made along the pathways surrounding the bog, where sand and peat have replaced some of the original fill, providing for better growth of conifers and plants of the heath family. The north side of the Knoll has been banked with logs to provide a shaded slope for the growth of native yew (*Taxus canadensis*) and plants naturally associated with that shrub. The brook has undergone the greatest change, the source having been entirely reconstructed with boulders and gneissic rocks received some years ago from the Brooklyn flower show. These rocks have been built up into the border mound directly south of the *Engler* memorial tree, the construction to be backed by *Rhododendron* plantings. A shaded slope along the brook will thus be provided for creeping snowberry (*Chiogenes*) and bunchberry (*Cornus canadensis*), which are now growing successfully in the Local Flora Section, but which have at present

only a very small area adapted to their needs. Other plants of northern distribution will undoubtedly prosper here. Several plants of the pink bog orchid (*Arethusa*) have been given by Mr. F. C. Seymour, to supplement the single specimen which we have had in previous years. Most of the plants native to our area are now established. Some, as for example, many native orchids, the woodland Lycopodiums, and the species of *Polygala*, seem to be practically impossible to grow under city conditions.

HERBARIUM MATERIAL LOANED

	<i>Sheets</i>
Correll, Dr. Donovan S., Duke Univ., Durham, N. C.....	152
Fassett, Dr. Norman C., University of Wisconsin, Madison.....	3
Johnston, Dr. I. M., Arnold Arboretum, Mass.....	526
Maxon, Dr. W. R., U. S. National Herbarium, Washington, D. C.....	1
O'Neill, Rev. Hugh, Catholic Univ. of America, Washington, D. C....	847
Perry, Dr. L. M., Gray Herbarium, Harvard University.....	3
Staten Island Museum, St. George, Staten Island, N. Y.....	15
Total.....	1,532

HERBARIUM MATERIAL BORROWED FOR STUDY

Carnegie Museum, Pittsburgh, Pa.....	111
Copenhagen, Universitetets Botaniske Have, Denmark.....	41
Core, Dr. E. L., Dept. Botany, Univ. W. Virginia, Morgantown.....	67
Duke University, Durham, N. C.....	106
Edson, Mrs. William L. G., Rochester, N. Y.....	1
Frick, Mr. T. A., Hiwassee College, Madisonville, Tenn.....	222
Gander, Mr. Frank, Natural History Museum, San Diego, Cal.....	23
Gray Herbarium, Harvard University, Cambridge, Mass.....	397
Grover, Dr. Frederick O., Oberlin College, Oberlin, Ohio.....	284
Howell, Mr. John Thomas, California Academy of Sciences, San Francisco, Cal.....	54
McVaugh, Dr. Rogers, Dept. of Botany, Univ. of Georgia, Athens....	2
Nelson, Dr. Aven, University of Wyoming, Laramie, Wyo.....	2
New York Botanical Garden, New York, N. Y.....	94
O'Neill, Rev. Hugh, Catholic Univ. of America, Washington, D. C....	472
Museum National d'Histoire Naturelle, Paris, France.....	18
U. S. National Museum, Washington, D. C.....	6
Total.....	1,903

HERBARIUM ACCESSIONS AND DISTRIBUTION

Phanerogamic Herbarium

Accessions:

By Gift:

Beals, Mr. A. Tennyson	1	
Bowen, Mr. Leon W.	1	
Drushel, Dr. J. A.	134	
Fosberg, F. R. & O. Fosberg	12	
Gilmore, Mr. Howard	1	
Hanmer, Mr. Charles C.	49	
Jennings, Mr. D. Arthur	2	
Nally, Mr. Julian	3	
Provost, Miss Eva M.	12	
St. John, Mr. Edward P.	2	
Tryon, Mr. R. M., Jr.	6	
Wagner, Mr. W. H., Jr.	1	
Wiley, Miss F., American Museum of Natural History	1	225

By Exchange:

Anderson, Dr. Edgar, Missouri Botanical Garden, St. Louis	1	
Blake, Mr. S. T., University of Queensland, Australia	110	
Deam, Mr. C. C., Bluffton, Ind.	6	
Demaree, Dr. Delzie, A. & M. College, Monticello, Ark.	441	
Edson, Miss Josephine, Rochester, N. Y.	6	
Gilbert, Prof. Frank A., Marshall College, Huntington, W. Va.	106	
Gray Herbarium, Harvard University	327	
Gruber, Mr. C. L., Kutztown, Pa.	2	
Hanes, Mr. C. R., Schoolcraft, Mich.	12	
Hayden, Dr. Ada, Iowa State College, Ames, Ia.	21	
Hermann, Dr. F. J., University of Michigan, Ann Arbor	30	
Holbert, Hon. Geo. K., Elizabethtown, Ky.	25	
Hopkins, Dr. Milton, Univ. Oklahoma, Norman, Okla.	2	
Kew, Royal Botanic Gardens, Kew, Surrey, England	43	
Muenschner, Dr. W. C., Cornell University	6	
New York Botanical Garden, Bronx Park, N. Y.	247	
Purer, Miss Edith, Hoover High School, San Diego, Cal.	83	
Tanaka, Prof. T., Taihoku Imperial University, Japan	158	
Tennessee, University of, Knoxville, Tenn.	100	
Torrey, Mr. Raymond H., Hollis, N. Y.	1	
U. S. National Herbarium, Washington, D. C.	15	
Wheeler, Mr. Louis C., La Vergne, Cal.	9	1,751

By Collection:

Gager, Dr. C. Stuart, Brooklyn Botanic Garden	2	
Graves, Dr. Arthur Harmount, Brooklyn Botanic Garden	3	
Svenson, Dr. Henry K., Brooklyn Botanic Garden	1,000	
Vilkomerson, Miss Hilda, Brooklyn Botanic Garden	7	1,012

By Purchase:

Harper, Prof. R. M., University of Alabama, University, Ala.	113	
Kittredge, Miss E. M., Vergennes, Vt.	84	
Wheeler, Mr. Louis C., Cambridge, Mass.	305	502
Total		3490

Distribution:

By Exchange:

Drew, Dr. Wm., University of Tennessee, Knoxville	1	
Hermann, Dr. Frederick J., Univ. Michigan, Ann Arbor	1	
Hultén, Dr. Eric, Botanic Garden, Lund, Sweden	180	
Manning, Dr. W. E., Smith College, Northampton, Mass.	3	185

Fungus Herbarium

Accessions:

Fungi:

By Gift:

Miss Grace A. Petersen, Woodhaven, N. Y.	34
--	----

By Exchange:

New York Botanical Garden, New York City	132
--	-----

By Purchase:

Dr. H. Sydow, Berlin, Germany	200
---	-----

Total	366
-----------------	-----

Respectfully submitted,

HENRY K. SVENSON,
Curator of the Herbarium.

REPORT ON THE LIBRARY FOR 1937

DR. C. STUART GAGER, DIRECTOR.

Sir: I submit herewith my report for the year ending December 31, 1937.

ACCESSIONS

The collections at present comprise 36,195 pieces, of which number 19,728 are volumes and 16,467 are pamphlets, an increase of 428 volumes and 537 pamphlets, or 965 pieces during 1937. Volumes purchased totaled 241. Gifts during the year were 163 volumes, 383 pamphlets, and 965 parts. The list of donors is included in Appendix I.

Of periodicals and other serials the library received 797 as exchanges, 97 as gifts, 150 as purchases, and 5 through publication by the Garden, making a total of 1,049 titles.

List of some important accessions

- Bigelow, Jacob. American medical botany . . . Boston, 1817-1820.
 Boysen-Jensen, Peter. Growth hormones in plants . . . New York, 1936.
 Bretschneider, Emil. History of European botanical discoveries in China. (Facsimile reprint of London 1898 edition.) Leipzig, 1935.
 California Geological Survey. Botany. (By W. H. Brewer, Sereno Watson and Asa Gray.) 2d rev. ed. Boston, 1880.
 Clinton-Baker, H. W. & Jackson, A. B. Illustrations of new conifers. Hertford, 1935.
 Culpeper, Nicholas. The English physitian: or An Astrologo-physical discourse of the vulgar herbs of this nation . . . London, 1652.
 Dillenius, J. J. Catalogus plantarum sponte circa Gissam nascentium . . . Francofurti ad Moenum, 1719.
 Elwes, H. J. & Henry, A. The Trees of Great Britain and Ireland. Edinburgh, 1906-1913.
 Evelyn, John. Acetaria. A Discourse of sallets. Brooklyn, Woman's Auxiliary, Brooklyn Botanic Garden, 1937.
 Evelyn, John. Fumifugium; or, The Inconvenience of the aer and smoake of London dissipated . . . London, 1772.
 Free, Montague. Gardening; a complete guide to garden making . . . New York, 1937.
 Hales, Stephen. Vegetable staticks . . . London, 1727. 1st ed.
 Hosack, David. Catalogue of plants contained in the Botanic Garden at Elgin in the vicinity of New York. New York, 1806. 1st ed. (Presentation copy from Hosack to Saml. L. Mitchill.)
 Linnaea; ein journal für die botanik in ihrem ganzen umfange. V. 1-43. Berlin, etc., 1826-1882.
 Linné, Carl von. Bibliotheca botanica . . . Amstelodami, 1736. 1st ed.
 Pasteur, Louis. Études sur le vin . . . Paris, 1866. 1st ed.
 Tansley, A. G. ed. Types of British vegetation . . . Cambridge, 1911.
 Went, F. W. & Thimann, K. V. Phytohormones. New York, 1937.

LIBRARY WORK

In actual library work there were a few changes in technique which may be worth recording.

On the shelves was much ephemeral material of a descriptive and historical nature relating to different societies and organizations. Each item had been cataloged separately with the consequence that there were many envelopes on the shelves and many entries in the catalog. It was found expedient to group all this

material together as [Descriptive and historical material] under the name of the organization concerned. This simplifies cataloging and searching for the material. It is now found in one place instead of scattered under such different titles as, Programs of annual meetings, Member lists, Constitution and by-laws, Articles of incorporation, Class schedules, etc. New items received are simply labeled [Descriptive and historical material] and filed in the envelope with no need to bring them out individually in the catalog.

The publications of the Brooklyn Botanic Garden, (excepting *Ecology* and *Genetics*), have been segregated from their alphabetical place in the serial collection and located conveniently near the entrance to the serial stacks. This saves many footsteps and allows of display to visitors who are shown through the library.

Filed immediately after these publications of the Brooklyn Botanic Garden are the reprints of articles by members of the staff. These were formerly filed in the pamphlet collection together with the sixteen thousand and odd pamphlets by other authors. Now they form the "Brooklyn Botanic Garden Staff collection" and together with the Garden publications above mentioned make materially visible the scientific and educational publications of members of the staff.

In connection with the pamphlet collection an economy was effected by putting in one pamphlet-cover several titles by the same author. This is being done with the new reprints as they are received. A more selective choice of the items to be included in the pamphlet collection serves to eliminate papers of no special interest to a botanical library, such as those on zoological, geological, and other subjects which are contained in publications which we receive regularly.

It is gratifying to report that during 1937 the library received 1,049 periodicals currently, thus passing the 1,000 mark for the first time. The importance of this type of literature for work in science is being constantly stressed by both scientific men and librarians. S. C. Bradford,¹ Librarian of the Science Museum, London, has stated, "In science, the records of experience are

¹ The Central Agricultural and Scientific Bibliography. Science Museum Library, London. By S. C. Bradford. Agricultural Library Notes. Nov. 1936, p. 569-573.

made for the most part, in the form of articles contributed to periodicals. Today, these records are being written at such a rate, some three quarters of a million times in a year, that we do not know where to find those of interest to us." He estimates that there are "fifteen thousand current scientific periodicals."

The librarian's task does not end with the acquiring of these periodicals. They must be protected from wear and loss of parts by binding. In December 569 volumes were prepared and sent to the binder. This represents the first binding done since December 1935 and but a fraction of the binding still needing to be done.

Revision of the classification scheme has been started. The present classes are being retained as far as practicable, but where needed, as in the economic botany section, a more logical division is being substituted. Grouping in "form" divisions by putting works on the history aspect of all subjects together instead of scattering them among the subjects will make reference easier and speedier. Definition and delimitation of terms will help to avoid ambiguity in some classes. It is hoped that by these means the weaknesses of the classification, which twenty years of use has exposed, may be corrected and that it may become a better tool for the arranging of the books in the library.

The library exhibit for Spring Inspection centered on the works of John Evelyn. This served to draw attention to the reprint of the first edition of his *Acetaria* which the Woman's Auxiliary of the Garden published this year. In addition to the library's copy of this work, used in making the reprint, other works by Evelyn were displayed as follows:

Acetaria. 2d edition. London, 1706

Kalendarium Hortense. London, 1664

Philosophical discourse of earth. 1st edition. London, 1676

Sylva. 1st edition. London, 1664

as well as numerous portraits of Evelyn and translations by him of other authors' works on gardening.

During the year personal contacts with other libraries and librarians were established. The libraries of the Brooklyn Museum, the Horticultural Society of New York, the American Museum of Natural History, the Garden Club of American, and

the New York Botanical Garden were visited. In return, we were favored with visits from Miss Elizabeth C. Hall, the new Librarian of the New York Botanical Garden; Miss Katharine Etz, Librarian of the Horticultural Society of New York; Miss Jessie M. Allen, Librarian of the Bureau of Plant Industry, of the U. S. Department of Agriculture, Washington, D. C.; Miss A. M. Avakian, Librarian of the California Forest and Range Experiment Station, Berkeley, California.

On May 20th a group of sixty librarians employed in the Brooklyn Public Library system visited the library under the direction of Miss Hopkins, of the Brooklyn Public Library. Two students from the Pratt Institute School of Library Science, Miss Pearl Spivak and Miss Elizabeth Mills, spent a day of observation and practice on April 19th and May 24th respectively.

On June 22 the Librarian attended the meeting of the Agricultural Libraries Section of the American Library Association, held at the Waldorf-Astoria Hotel. He also attended the Fall meeting of the Special Libraries Association, New York Chapter. During the year he was a member of the Committee on Libraries in National Parks, of the American Library Association.

The Librarian had the pleasure on February 3 of addressing the members of the Woman's Auxiliary on, "Interesting items in the library collection." During the year a committee on the library was formed by the Woman's Auxiliary. This committee's function is essentially that of interesting others in the library's resources, its use and its needs. It is hoped that an awakened sense of the importance of the library in the scientific, educational, and cultural aspect of the Brooklyn Botanic Garden work will be instilled and that a measure of added support will result. That its resources are of use and value to the Woman's Auxiliary has been demonstrated by its use of the library's copy of the first edition of John Evelyn's *Acetaria* in making its 1937 reprint, and by the use of illustrations from the collection of old Herbals in designing the cover of the Herb Luncheon invitation. The library's books on flower arrangement have been freely used in connection with courses sponsored by the Woman's Auxiliary.

INTERLIBRARY LOANS

The chart showing the extent of the lending of books to other libraries by the Brooklyn Botanic Garden Library was brought up

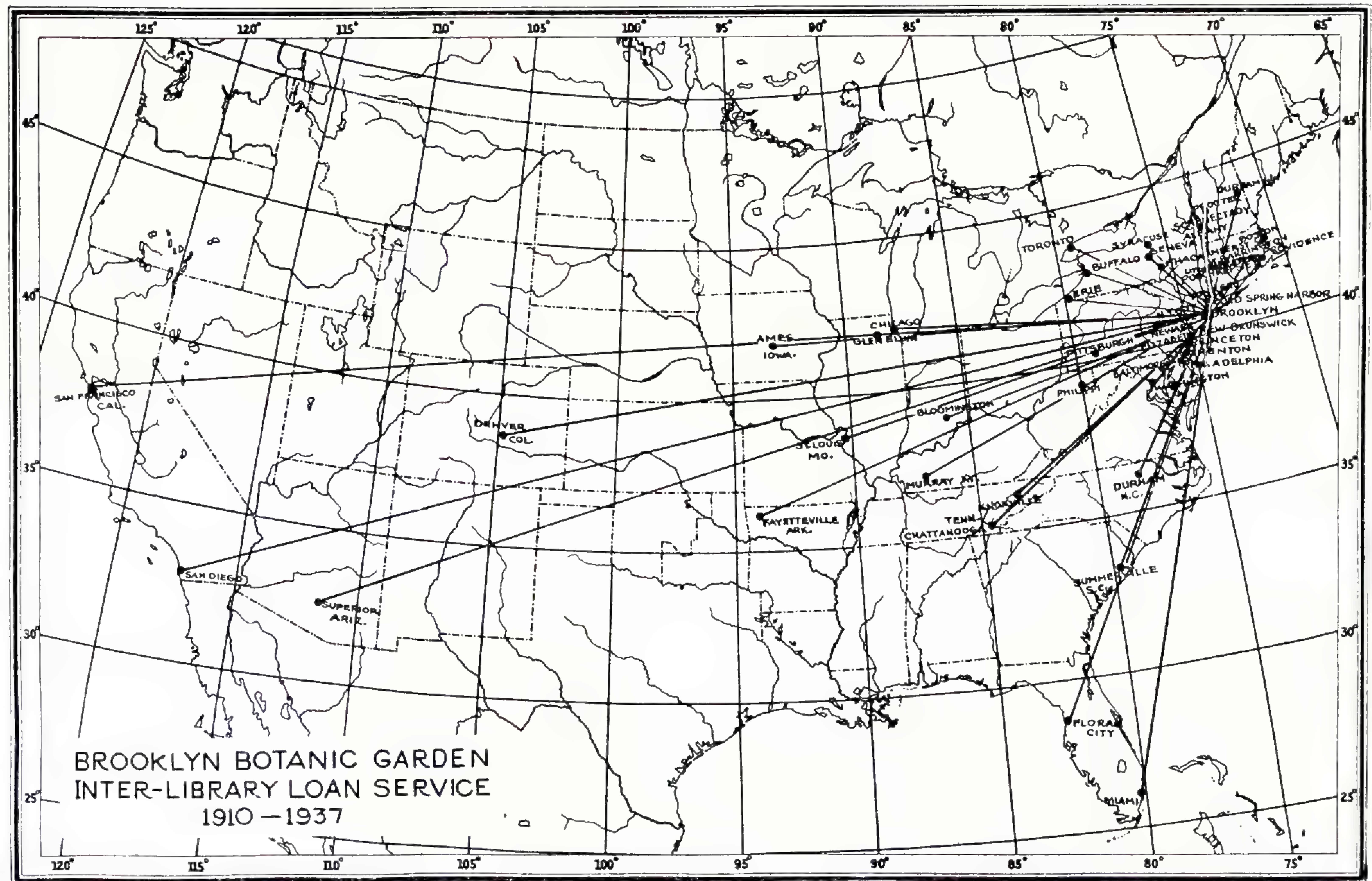


FIG. 7. Map showing geographical range of the inter-library loan service of Brooklyn Botanic Garden Library. (9348)

to date and is reproduced herewith (fig. 7). Each line represents a helping hand, an extension of the use of the library's resources to some distant worker. During the period from 1910 through 1937 loans totaling over 800 volumes have been extended to over 84 libraries including those of universities, colleges, horticultural societies, learned societies, research agencies, industrial firms, medical organizations, state and federal agencies, public libraries, museums, and others.

That such help is of great value is shown by the letter of appreciation recently received from Dr. Philip R. White, of the Rockefeller Institute for Medical Research, Princeton, N. J. Lately Dr. White has been in the public eye as the winner of the thousand dollar prize of the American Association for the Advancement of Science. His work on root pressure as a cause of the rise of sap in plants has received extensive newspaper publicity. In his letter he states: "In the past eight years that I have been working in and near New York, I have repeatedly had occasion to make use of these facilities. No other organization that I know of, within this area, which does permit its publications to go out on interlibrary loan has anywhere nearly as complete a collection of the literature of botany, particularly the older literature. I think that any aid that can be given to further this undertaking would surely be well placed. You may quote me to that effect and I shall be very glad to write to anyone who is particularly interested."

During the year the library loaned 52 volumes for use in other institutions and borrowed 42 volumes for use by staff members of the Garden.

Books were loaned to: Boyce Thompson Institute, Yonkers, N. Y.; Carnegie Institution of Washington, Dept. of Genetics, Cold Spring Harbor, L. I.; Columbia University, New York; Haddon Craftsmen, Camden, N. J.; Johns Hopkins University, Baltimore, Md.; Long Island College of Medicine, Brooklyn; New York State College of Agriculture, Ithaca; New York State Library, Albany; New York University, Washington Square; New York University, College of Medicine; University of Rochester, Rush Rhees Library, Rochester, N. Y.; Rockefeller Institute for Medical Research, New York and Princeton, N. J.; Smith College

Library, Northampton, Mass.; University of Tennessee, Knoxville, Tenn.

Books were borrowed from: American Museum of Natural History, New York; Arnold Arboretum, Harvard University, Jamaica Plain, Mass.; Brooklyn Public Library; Columbia University, New York; Harvard College Library, Cambridge, Mass.; Horticultural Society of New York; New York Botanical Garden; U. S. Department of Agriculture, Washington, D. C.; Yale University, New Haven, Conn.

The statistical report follows

Respectfully submitted,
WILLIAM E. JORDAN,
Librarian.

STATISTICAL REPORT ON THE LIBRARY

ACCESSIONS

	Autograph Letters	Portraits	Volumes	Pamphlets	Parts (Including Periodicals)
Exchange	0	0	24	141	4,662
Gift	33	16	163	383	965
Publication	0	0	0	0	45
Purchase	5	1	241	13	1,080
By binding	0	0	0	0	0
Total	38	17	428	537	6,752

Total number of volumes in library, December 31, 1936	19,300
Number of volumes added during 1937	428
Total number of volumes in library, December 31, 1937	19,728
Total number of pamphlets in library, December 31, 1936	15,930
Number of pamphlets added during 1937	537
Total number of pamphlets in library, December 31, 1937	16,467
Total number of volumes and pamphlets in library, December 31, 1936	35,230
Net increase of volumes and pamphlets during 1937	965
Total number of volumes and pamphlets in library, December 31, 1937	36,195

AMERICAN FERN SOCIETY COLLECTION

Number of volumes, December 31, 1936	43
Number of volumes added during 1937	0
Total number of volumes, December 31, 1937	43

Number of pamphlets, December 31, 1936	249
Number of pamphlets added during 1937	7
Total number of pamphlets, December 31, 1937	256
Number of parts added during 1937	28

SERIALS AND PERIODICALS

(Including only those of which numbers were received in 1937)

Subscription	150
Gift	97
Exchange	797
Publication	5
Total	1,049

CATALOGING

Books, Pamphlets, and Serials cataloged	1,038
Total number of cards typewritten and filed	1,773

PRINTED CARDS

Torrey Botanical Club index cards on file, December 31, 1936	51,654
Filed during 1937	1,640
Total, December 31, 1937	53,294

MISCELLANEOUS

Number of users of the library	4,428
Books lent to members of the staff	1,466
Books lent to other institutions	52
Books borrowed from other institutions	42

REPORT OF THE RESIDENT INVESTIGATOR (FERNS) FOR 1937

DR. C. STUART GAGER, DIRECTOR.

Sir: I submit herewith my report for the year ending December 31, 1937.

SCHOOL SERVICE

Continuing as Chairman of the Program Committee of the New York Association of Biology Teachers, the program for the school year, 1937-1938, has been worked out in conference with the Executive Committee of that Organization. Besides several

speakers, the 1937 program included a new departure, a symposial discussion by several high school teachers. The topic of Eugenics was presented in four phases by Mr. Harry Mack, of Newtown High School, Mr. George Lash, of Bayside, Mr. Joseph Selkove, of Boys High School, and Mrs. Hortense Nathan, of Eastern District High School. This group met as a committee at the Brooklyn Botanic Garden several times, to plan their program. Mr. Frederick Osborn aided them in preliminary meetings and presided at the final discussion in April.

The Botanic Garden was also the headquarters for the organization of another new activity on the part of high school biology teachers. Responding to an open letter in the *Teaching Biologist*, about twenty teachers met at the Garden during February, and several times thereafter to formulate plans for stimulating interest and participation in research among high school teachers. Conferences were held with members of the Brooklyn Garden staff, and with the staffs of the New York Botanical Garden and the American Museum of Natural History by the Resident Investigator, and many other conferences were held by teacher members of the group with biologists of local universities, and other institutions. The net result so far is twofold: (1) A number of teachers are engaged in research projects; (2) interest in research and scholarship has been considerably heightened.

I have continued my service as college representative for Biology on the Science Council.

EDITORIAL WORK

The American Fern Journal has completed its 27th volume. The American Fern Society has again reached a position where an increase in the size of the Journal is contemplated. A number of articles for the Journal have been received, discussed with their authors, and brought into shape for publication.

FERN WORK

The *Nephrolepis* collections have been maintained, both as a basis for exhibition and examples of extreme variation, in preparation for further study. Mr. Fosburgh, of the University of Hawaii, who is studying at the University of Pennsylvania this

year, brought his Hawaiian collection of this genus for identification, and contributed a good series of herbarium specimens.

Three graduate students of Columbia, who had used fern material from the Botanic Garden in research, completed their degree work and have prepared papers for publication, to appear in 1938.

PLANT CONSERVATION

There is a never-ending interest in the subject of the conservation of native plants, as indicated by occasional letters and requests for information. Another culture of the hart's-tongue fern has been raised for distribution. A paper on the raising of ferns from spores is in the process of printing, through which interest in the multiplication of native species, it is hoped, may be fostered.

During 1937, a textbook designed for high school biology has been put through the press, under the authorship of R. C. Benedict, W. W. Knox, and G. K. Stone, and will be published early in 1938. The Brooklyn Botanic Garden is well represented in this text in the form of experimental work carried on here, and in numerous pictures for which grateful acknowledgment is made.

Respectfully submitted,

RALPH C. BENEDICT,
Resident Investigator (Ferns).

REPORT OF THE RESIDENT INVESTIGATOR (ECONOMIC PLANTS) FOR 1937

DR. C. STUART GAGER, DIRECTOR.

Sir: I herewith submit a report of the activities of the Resident Investigator for Economic Plants during 1937. With the consent of the Garden, the Brooklyn Botanic Garden-Long Island University Course (B-15, 16) in Economic Plants, was omitted during the 1937-1938 academic year. Plans for the rearrangement of the plants in the Economic House were determined in conference with Mr. Montague Free, the Botanic Garden Horticulturist. A living collection of twenty species of her-

baceous plants used in various beverages was presented to the horticulturist to be added to the Garden's economic display.

Reports on research, lectures, and publications are given elsewhere in the Annual Report under their respective headings.

Respectfully submitted,

RALPH H. CHENEY,
Resident Investigator (Economic Plants).

REPORT OF THE FIELD SECRETARY FOR 1937

DR. C. STUART GAGER, DIRECTOR.

Sir: Herewith I present my report for the year ending December 31, 1937.

Four lectures and demonstrations were scheduled for the Flower Arrangement course held Wednesday mornings from January thirteenth to February third. Mrs. Ernest Frederick Eidlitz, Mrs. Yoneo Arai, Mrs. Roy M. Lincoln, Mrs. Ronald Hart, Mr. Philip Pratt, of Pratt Institute and Mrs. Henry J. Davenport were the guest speakers. Ninety-six persons registered for the course with sixty-three additional attending individual lectures. The final session, a demonstration of original arrangements by members of the class, was followed by the annual luncheon of the Woman's Auxiliary. One hundred and seven members and guests were present. Mr. William E. Jordan spoke on the collection in the Botanic Garden library.

Early in the year one thousand letters were prepared and sent to Garden members asking them to recommend names of prospective members. Personal letters were sent to those whose names were suggested.

Under the Chairmanship of Mr. Philip A. Benson, a Sponsoring Committee was formed and a letter of appeal was sent to a selected list in behalf of funds to cover the budget deficiency. Approximately four hundred letters were prepared and mailed, signed by members of the committee. In response eighty-five persons contributed to the fund. Of these thirty-four were members of the Woman's Auxiliary.

During the year I have addressed sixteen gatherings in New

York, New Jersey, and on Long Island, as well as at the Garden. These meetings varied greatly in size with a total of 1048 persons.

Following the decision of the Woman's Auxiliary to publish a reprint of *Acetaria, a Discourse of Sallets*, by John Evelyn, originally published in 1699, a great deal of time was spent looking up the history of the book and its author. A typed copy of the original was made for the printer, indicating the archaic type and format; a publisher's notice was prepared and the reprint was publicised by articles to horticultural and gardening publications and by extensive circularizing. Printed by The Haddon Craftsmen, under the supervision of Richard Ellis, the first copies were issued in December.

During the summer plans were made for the Auxiliary benefit in January. Mrs. Constance Spry, the foremost flower decorator of England, was engaged to give two lectures. A course on "Planning and Planting the Small Place" was also arranged for the first of the year, with Miss Helen Swift Jones, guest speaker, collaborating with Mr. Free.

On Wednesdays during October, I gave the second series of lecture-demonstrations on Flower Arrangement for a class of twenty-three persons. In the fall also, about five hundred letters were sent to prospective members, and the fall folder of courses was prepared and mailed to a large list in addition to the membership. "Botany in Your Garden," a new course for members was specially circularized. Personal letters were sent to all delinquent members urging their continued support. Although the circularizing and membership work has been curtailed during the year, the volume of letters and mail sent through my office has been as large as usual because of the activities of the Auxiliary and the publication of *Acetaria*.

At the annual meeting held in November, Mrs. Irving L. Cabot concluded two active years as President of the Woman's Auxiliary and was succeeded by Mrs. Henry J. Davenport. Other officers elected to serve in 1938 were, Mrs. Irving L. Cabot, Vice-President; Mrs. George E. Brower, Secretary; and Miss Jessie H. Righter, Treasurer.

Respectfully submitted,

GERTRUDE W. MERRILL,
Field Secretary.

FINANCIAL STATEMENT FOR 1937

I. TAX BUDGET ACCOUNTS

<i>Code No.</i>	<i>Account</i>	<i>Appropriated</i>	<i>Additional Appropriation</i>	<i>Expended</i>	<i>Balance Dec. 31, 1937</i>	<i>Balance to Code Number</i>
	Personal Service					
1530	Regular Employees	\$56,508.92	\$1,920.08	\$58,410.85	\$18.15	
1531	Temporary Employees	12,560.00	5,203.75	17,763.75	0.00	
	Total Personal Service	\$69,068.92	\$7,123.83	\$76,174.60	\$18.15	
	Restoration of Emergency Cut	1,920.08				
	Additional Appropriation	5,203.75				
	Total Personal Service	\$76,192.75				
	Other Than Personal Service					
1532	Fuel Supplies	*\$ 3,440.00		\$ 3,438.42	\$ 1.58	
1533	Office Supplies	675.00		675.00	0.00	
1534	Laundry, Clean. Dis. Sup.	200.00		200.00	0.00	
1535	Bot. and Agric. Supplies	2,250.00		2,250.00	0.00	
1536	Motor Vehicle Supplies	* 75.00		88.44	0.06	
1537	General Plant Supplies	250.00		250.00	0.00	
1538	Office Equipment	75.00		49.50	25.50	
1539	General Plant Equipment	1,500.00		1,500.00	0.00	
1540	General Plant Materials	1,400.00		1,400.00	0.00	
1541	Repairs and Replacements	2,200.00		2,200.64	0.00	
1542	Telephone Service	500.00		434.68	65.32	{ \$28.71 to 1536-41-43
1543	Carfare	50.00		64.57	0.00	
1544	Expressage and Deliveries	200.00		169.84	30.16	
1545	General Plant Service	400.00		400.00	0.00	
1546	Contingencies	50.00		50.00	0.00	
	Total Other Than Personal Service	\$13,265.00		\$13,171.09	\$93.91	
	Total Expended			\$89,345.69		
	Balance, Dec. 31, 1937.....				\$112.06	
1532*	Transferred to Department of Purchase, General Purchase Fund					\$3,440.00
1536*	“ “ “ “ “ “ “ “ “					75.00

II. PRIVATE FUNDS ACCOUNTS

<i>Title of Permanent Funds (Restricted)</i>	<i>Principal</i>	<i>Balance Jan. 1, 1937</i>	<i>Income</i>	<i>Available</i>	<i>Expended</i>	<i>Balance Dec. 31, 1937</i>
1. Endowment Fund	\$ 50,500.00	\$ 0.00	\$ 1,767.48	\$ 1,767.48	\$ 1,767.48	\$ 0.00
2. Life Membership	7,100.00	0.00	255.50	255.50	255.50	0.00
3. George C. Brackett	500.00	0.00	17.48	17.48	17.48	0.00
4. Benjamin Stuart Gager	13,417.20	27.25	469.60	496.85	422.70	74.15
5. Martha Woodward Stutzer	10,000.00	17.90	350.00	367.90	313.75	54.15
6. Mary Bates Spalding	2,697.00	217.63	94.36	311.99	107.75	204.24
7. Alfred T. White	243,149.27	0.00	8,510.24	8,510.24	8,510.24	0.00
8. A. Augustus Healy Bequest	9,798.31	0.00	342.92	342.92	342.92	0.00
9. Robert B. Woodward	25,000.00	0.00	875.00	875.00	875.00	0.00
10. Endowment Encrement	139,379.15	0.00	4,707.50	4,707.50	4,707.50	0.00
11. A. T. White Memorial Tablet	3,889.85	0.00	136.12	136.12	136.12	0.00
12. Bklyn Inst. Centennial	30,000.00	0.00	1,050.00	1,050.00	1,050.00	0.00
13. John D. Rockefeller, Jr.	250,000.00	0.00	8,750.00	8,750.00	8,750.00	0.00
14. Citizen's Endowment	253,929.26	0.00	8,887.51	8,887.51	8,887.51	0.00
15. Henry W. Healy Trust	53,660.92	5.20	1,618.96	1,624.16	1,540.96	83.20
16. Mrs. H. C. Folger	1,000.00	62.62	35.00	97.62	50.00	47.62
17. John W. Frothingham	10,000.00	120.15	362.69	482.84	482.84	0.00
18. F. E. W. Fund	250,000.00	0.00	4,375.00	4,375.00	2,350.74	2,024.26
Total	\$1,354,020.96	\$ 450.75	\$42,605.36	\$43,056.11	\$40,568.49	\$ 2,487.62
<i>Special Accounts (Restricted)</i>						
19. Sustaining Membership		0.00	516.46	516.46	333.20	183.26
20. Annual Membership		227.24	4,702.13	4,929.37	4,417.46	511.91
21. Tuition and Sales		3,360.00	11,866.33	15,226.33	11,880.23	3,346.10
22. Collections Fund		227.24	5,547.98	5,775.22	5,731.28	43.94
23. Cary Library Allotment		3.11	70.00	73.11	45.07	28.04
24. Special Purposes		1,568.49	12,056.96	13,625.45	6,252.40	7,373.05
25. Plant Pathology Research		83.66	6,500.00	6,583.66	6,583.66	0.00
26. Special Contributions		41.00	240.00	281.00	44.62	236.38
Total		\$5,510.74	\$41,499.86	\$47,010.60	\$35,287.92	\$11,722.68
Grand Total	\$1,354,020.96	\$5,961.49	\$84,105.22	\$90,066.71	\$75,856.41	\$14,210.30

III. SUMMARY OF TOTAL MAINTENANCE BUDGET FOR 1937

		<i>Income</i>			<i>Expended</i>			<i>Balance</i>
		<i>Personal Service</i>	<i>Other than Personal Service</i>	<i>Total</i>	<i>Personal Service</i>	<i>Other than Personal Service</i>	<i>Total</i>	<i>Dec. 31, 1937</i>
Tax Budget								
Appropriation	49.83%	\$ 76,192.75	\$13,265.00	\$ 89,457.75	\$ 76,174.60	\$13,171.09	\$ 89,345.69	\$ 112.06
Private Funds								
Budget	50.17%	56,365.85	33,700.86	90,066.71	56,129.47	19,726.94	75,856.41	14,210.30
Totals		\$132,558.60	\$46,965.86	\$179,524.46	\$132,304.07	\$32,898.03	\$165,202.10	\$14,322.36

Respectfully submitted,
DANIEL C. DOWNS,
Secretary and Accountant.

Note: The above "Financial Statement" is a transcript of Brooklyn Botanic Garden accounts in the books of the Treasurer of the Brooklyn Institute of Arts and Sciences. The Treasurer's accounts are audited annually by a Public Accountant, and a separate audit of this "Financial Statement" is not made in order to save unnecessary expense.

EDWIN P. MAYNARD,
Treasurer.

APPENDIX 1

GIFTS RECEIVED DURING 1937

Collections Fund and Budget Difference

Leo Aarons, Inc.	Mrs. Palmer H. Jadwin
Mrs. Frank L. Babbott	William L. James
Mrs. Robert Bacon	Miss Jeanetta Jameson
Battle Pass Chapter (D. A. R.)	Mrs. P. C. Jameson
Philip A. Benson	Ralph Jonas
Miss Dorothy L. Betts	James H. Jourdan
Edward C. Blum	A. S. Lamphear
Mrs. Edward C. Blum	R. C. Leffingwell
Frank D. Brower	Miss Hilda Loines
Mrs. Armin E. Brunn	Mrs. Stephen Loines
Mrs. Glentworth R. Butler	Mrs. Wm. W. Marshall
Miss Mary Butterick	Joseph M. May
Mrs. Irving L. Cabot	Mrs. Frank Melville
Mrs. S. Parkes Cadman	Dr. F. G. Merz
Miss Mary Campbell	Miss Marion S. Morse
Mrs. Otis S. Carroll	Alfred Mudge
Mrs. Wm. H. Cary	Mrs. Alfred Mudge
Mrs. Wm. H. Childs	Henry C. Needham
Mrs. Francis T. Christy	Mrs. Frederic C. Paffard
W. R. Coe	Port Washington Garden Club
Mrs. Walter V. Cranford	James H. Post
Walter H. Crittenden	Mrs. J. H. Post
Mrs. John R. Delafield	Charles E. Potts
John H. Denbigh	Mrs. F. B. Pratt
Miss Anne Dorrance	Mrs. Benjamin Prince
Otto Ebel	Mrs. William A. Putnam
Walter Ebel	Mrs. John S. Roberts
Walter D. Ebinger	Mrs. J. E. Spingarn
Mrs. Ernest F. Eidlitz	Mrs. Seth Thayer Stewart
Mrs. Wm. Emerson	Miss Elise W. Stutzer
George W. Felter	Mrs. John T. Underwood
Mrs. Lewis W. Francis	Mr. Jeremiah R. Van Brunt
Alexander B. Gale	Mrs. Jeremiah R. Van Brunt
Mrs. Otto Goetze	"C. W."
Mrs. William H. Good	Edwin G. Warner
Mrs. J. Morton Halstead	William J. Wason, Jr.
Mrs. A. A. Healy	Mrs. R. C. Weithas
Tracy Higgins	Alain White
Miss Anna Hollwegs	Mrs. Alexander M. White
William T. Hunter	Miss Frances E. White
Miss C. Julie M. Husson	Miss Harriet H. White
Mrs. Raymond V. Ingersoll	Women of '76 Chapter N. S. D. A. R.
Edward A. Ingraham	Peter Piper Wright
Miss Frances T. Ingraham	Miss Abigail Young

Chestnut Breeding Project

National Academy of Sciences.....	\$545.00
-----------------------------------	----------

Special Gifts for Children's Work

Charles Degen.....	25.00
Kindergarten Mothers Club.....	100.00
Public School No. 233 Brooklyn.....	5.00
Girls Commercial High School Annex.....	5.75

Children's Endowment Fund

From a Friend.....	100.00
Boys' and Girls' Club B. B. G.....	25.00
Vilma and Ruthann Raskin.....	2.00
David Gladstone.....	1.00
Mrs. Maxwell Karshan.....	3.00
Julius Sherman.....	2.00

Flower Show Exhibit

International Exposition Co.....	250.00
----------------------------------	--------

Completion of Overlook

Woman's Auxiliary.....	600.00
------------------------	--------

Woman's Auxiliary Reimbursement Account

Course in Flower Arrangement.....	103.75
Spring Inspection.....	22.02

Miscellaneous

Sidney Maddock Bequest (partial payment).....	5000.00
Fort Green Chapter D. A. R.....	5.00

Library

BOOKS

Alt-Müller, Helen K., Estate of, Brooklyn, N. Y.....	4
American Chemical Society, New York, N. Y.....	2
American Museum of Natural History, New York, N. Y.....	23
Ames, Professor Oakes, Cambridge, Mass.....	1
Arai, Mrs. Yoneo, Riverside, Conn.....	1
Babbott, Mrs. Frank L., Jr., Brooklyn, N. Y.....	1
Brazil, Ministerio de Agricultura y Obras Publicas, Rio de Janeiro.....	3
Brooklyn Museum, Brooklyn, N. Y.....	3
Brower, Mr. Ancel J., New York, N. Y.....	1
Cabot, Mrs. Irving L., Brooklyn, N. Y.....	2
Carnegie Institution of Washington, Washington, D. C.....	3

Chilean Nitrate Educational Bureau, Inc., New York, N. Y.....	1
Downs, Mr. Daniel C., Brooklyn, N. Y.....	2
Evans, Hon. Marcellus H., New York, N. Y.....	1
Fardelmann, Miss Margaret, Brooklyn, N. Y.....	1
Francis, Mrs. Lewis W., Brooklyn, N. Y.....	2
Free, Mr. Montague, Brooklyn, N. Y.....	1
Gager, Dr. C. Stuart, Brooklyn, N. Y.....	15
Gager, Mrs. C. Stuart, Brooklyn, N. Y.....	2
Hammond, Miss Elsie T., Brooklyn, N. Y.....	1
Japanese Government Railways, Board of Tourist Industry, Tokyo.....	4
Levine, Miss Roberta M., Brooklyn, N. Y.....	1
Lewis, Mr. Clarence McK., New York, N. Y.....	3
Lilly, Eli & Company, Indianapolis, Ind.....	1
Liu, Mr. J. C., Peking, China.....	1
Mansfield, Miss Louise, Brooklyn, N. Y.....	1
Mellen, Miss Ida, Brooklyn, N. Y.....	1
Myerson, The Misses Amy and Elizabeth, Brooklyn, N. Y.....	1
National Shade Tree Conference, New Brunswick, N. J.....	1
New York Florists' Club, New York, N. Y.....	1
Parent-Teachers Association, P. S. 117, Queens.....	1
Peiping (China) Natural History Bulletin.....	1
Pi Lambda Theta, Rho Chapter, New York University, New York, N. Y.	6
The Pierpont Morgan Library, New York, N. Y.....	1
Sayles, Mrs. Robert Wilson, Chestnut Hill, Mass.....	1
Scott, O. M. & Sons, Marysville, Ohio.....	10
Shaw, Miss Ellen Eddy, Brooklyn, N. Y.....	1
Sherwin, The Misses Jean and Gladys, Brooklyn, N. Y.....	1
Smalley, Mr. Melvin A., Brooklyn, N. Y.....	2
Svenson, Dr. Henry K., Brooklyn, N. Y.....	2
Wageningen, Institut voor Plantenveredeling, Holland.....	5
White, Mr. Alain, Litchfield, Conn.....	4
Winston, Mr. Stuart, Brooklyn, N. Y.....	3
Total.....	123

PAMPHLETS

Albaum, Dr. H. G. & Kaiser, Mr. Samuel, Brooklyn, N. Y.....	1
American Fern Society.....	1
Anderson, Clayton & Company, Houston, Texas.....	1
Asociacion Sudamericana de Botanica, Montevideo, Uruguay.....	3
Baker, Mr. F. W., Concord, N. H.....	1
Benedict, Dr. Ralph Curtiss, Brooklyn, N. Y.....	6
Brierley, Dr. William B., Reading, England.....	1
Brooklyn Museum.....	4
Carnegie Institution of Washington, Washington, D. C.....	2
Coconut Research Scheme, Ceylon, India.....	1
Croizat, Dr. Leon, New York, N. Y.....	4

Ernst, Dr. Alfred, Zürich, Switzerland.....	6
Everett, Mr. T. H., New York, N. Y.....	1
Fieser, Mr. L. F., Cambridge, Mass.....	1
Fischer, Mr. George L., Maplewood, N. J.....	2
Fosberg, Mr. F. Raymond, Honolulu, Hawaii.....	5
Frans Hals Museum, Haarlem, Holland.....	1
Free, Mr. Montague, Brooklyn, N. Y.....	3
Gager, Dr. C. Stuart, Brooklyn, N. Y.....	137
Graves, Dr. Arthur Harmount, Brooklyn, N. Y.....	7
Greenfield, Mr. Sydney S., New York, N. Y.....	1
Gruenberg, Dr. Benjamin C., New York, N. Y.....	1
Güssow, Dr. H. T., Ottawa, Canada.....	1
Harper, Dr. Roland M., University, Alabama.....	2
Herbst Bros., New York, N. Y.....	1
Hunger, Dr. F. W. T., Leiden, Holland.....	1
Jardin de la Paz, La Plata, Argentina.....	1
The John Innes Horticultural Institution, London, England.....	1
Langendonck, Dr. H. J. van, Gent, Belgium.....	5
Louisiana State Museum, New Orleans, La.....	1
Marsh, Mrs. Florence Wilder, Washington, D. C.....	1
Massachusetts State College, Dept. of Landscape Architecture, Amherst, Mass.....	1
Mellen, Miss Ida, Brooklyn, N. Y.....	2
Nilsson, Dr. Heribert, Lund, Sweden.....	2
Pennington, Mr. Pleasants, New York, N. Y.....	1
Phillips, Dr. E. P., Pretoria, South Africa.....	72
Reed, Dr. George M., Brooklyn, N. Y.....	7
Rockefeller Institute for Medical Research, New York, N. Y.....	9
Russia. Arctic Alpine Botanical Garden, Kirov, Kola Peninsula.....	1
St. John, Mr. Harold, Honolulu, Hawaii.....	4
Scott, O. M. & Sons Co., Marysville, Ohio.....	1
Sherff, Dr. E. E., Chicago, Ill.....	3
Simmons, Dr. Perez, Fresno, Calif.....	1
Sirks, Dr. M. J., Groningen, Holland.....	6
Snell, Dr. Walter H., Providence, R. I.....	21
Spingarn, Mr. J. E., Amenia, N. Y.....	1
Stanley, Dr. W. M., Princeton, N. J.....	8
Tubbs, Mr. F. R., Tea Research Institute, Ceylon.....	1
Tucker, Miss Ethelyn M., Jamaica Plain, Mass.....	2
United Brewers' Industrial Foundation, New York, N. Y.....	7
Utter, Dr. L. Gordon, Brooklyn, N. Y.....	2
Victorin, Frère Marie-, Montreal, Canada.....	1
Wehnelt, Dr. Bruno, Köln Flittard, Germany.....	1
Wilderness Society, Washington, D. C.....	1
Zillig, Dr. Hermann, Berncastel-Cues, Mosel, Germany.....	3
Total.....	362

PARTS OF PUBLICATIONS
(Exclusive of Government Documents)

American Fern Society.....	8
American Horticultural Society, Washington, D. C.....	4
American Scenic and Historic Preservation Society, New York, N. Y....	2
American Tree Association, Washington, D. C.....	2
Ames, Professor Oakes, Cambridge, Mass.....	8
Bailey, Professor Liberty Hyde, Ithaca, N. Y.....	1
Bartlett Tree Research Laboratories, Stamford, Conn.....	63
Benedict, Dr. Ralph Curtiss, Brooklyn, N. Y.....	3
Botanische Verein der Provinz Brandenburg, Berlin-Dahlem, Germany..	1
British Columbia, Provincial Museum of Natural Historia, Victoria.....	1
Brooklyn Museum.....	2
Cambridge University, Botanic Garden Syndicate, Cambridge, Eng.....	1
Carnegie Institution of Washington, Washington, D. C.....	2
Carr, Mr. William H., New York, N. Y.....	1
Chinese Botanical Society, Peiping, China.....	4
Cincinnati Museum of Natural History, Cincinnati, Ohio.....	1
Clarkson, Mrs. Rosetta E., New Rochell, N. Y.....	10
Colorado Scientific Society, Denver, Col.....	2
Colorado, University of, Boulder, Col.....	1
Committee on the Relation of Electricity to Agriculture, Chicago, Ill....	3
Croizat, Dr. Leon, New York, N. Y.....	1
Crum, Miss Ethel K., (California Botanical Society), Berkeley, Cal.....	1
Darlington, Professor H. T., East Lansing, Mich.....	1
Diehle, Mr. R., Versailles, France.....	1
Doney, Mr. Charles F., Brooklyn, N. Y.....	1
DuPont de Nemours & Company, Inc., Wilmington, Del.....	11
Fisher Scientific Company, Pittsburgh, Pa.....	1
Flushing Garden Club, Flushing, L. I.....	1
Fosberg, Mr. F. Raymond, Honolulu, Hawaii.....	4
Free, Mr. Montague, Brooklyn, N. Y.....	32
Gager, Dr. C. Stuart, Brooklyn, N. Y.....	33
Graves, Dr. Arthur Harmount, Brooklyn, N. Y.....	65
Hawaiian Academy of Science, Honolulu, Hawaii.....	2
Idaho, University of, Associated Foresters, Moscow, Idaho.....	1
Illinois Audubon Society, Chicago, Illinois.....	1
Imperial Bureau of Plant Genetics, Aberystwyth, Wales.....	3
International Euphorbia Society, Los Angeles, Cal.....	10
Jenkins, Mr. Charles F., Germantown, Philadelphia, Pa.....	4
Jones, Mrs. R. W., Brooklyn, N. Y.....	33
Lafrentz, Miss Olga, Brooklyn, N. Y.....	1
McFarland, J. Horace Company, Breeze Hill, Harrisburg, Pa.....	4
Medical Society of the County of Kings, Brooklyn, N. Y.....	13
Mellen, Miss Ida, Brooklyn, N. Y.....	2
Mount Desert Island Biological Laboratory, Salisbury Cove, Me.....	1

National Research Council, Washington, D. C.....	5
National Research Council, Ottawa, Canada.....	2
National Research Council of Japan, Tokyo, Japan.....	2
New York Association of Biology Teachers, New York, N. Y.....	17
New York Public Library.....	2
New Zealand Institute of Horticulture, Wellington, N. Z.....	24
Ohara Institute for Agricultural Research, Kurashiki, Japan.....	1
Pennsylvania, University of, Library, Philadelphia, Pa.....	2
Pyle, Mr. Robert, Harrisburg, Pa.....	1
Reed, Dr. George M., Brooklyn, N. Y.....	47
Rensselaer Polytechnic Institute, Troy, N. Y.....	1
Roosevelt Wild Life Forest Experiment Station, Syracues, N. Y.....	2
Rothamsted Experimental Station, Harpenden, Herts, England.....	1
St. John, Dr. Harold, Honolulu, Hawaii.....	3
Schmid, Dr. Gunther, Darmstadt, Germany.....	1
School Garden Association, New York, N. Y.....	7
School Nature League, New York, N. Y.....	16
Scientific Expedition to Manchoukuo, Waseda University, Tokyo, Japan.....	2
Sherff, Dr. E. E., Chicago, Ill.....	6
Snell, Dr. Walter H., Providence, R. I.....	1
Sociedad Española de Historia Natural, Madrid, Spain.....	5
Southern Methodist University, Dallas, Texas.....	2
Taihoku Imperial University, Herbarium, Formosa, Japan.....	5
Tôhoku Imperial University, Sendai, Japan.....	1
Towson Nurseries, Inc., Towson, Md.....	4
Uppsala Botanical Institute, Uppsala, Sweden.....	3
Washington University, Arboretum Foundation, Seattle, Wash.....	1
Wilderness Society, Washington, D. C.....	1
Yale University, School of Forestry, New Haven, Conn.....	6
Total.....	518

PORTRAITS AND PHOTOGRAPHS

Gager, Dr. C. Stuart, Brooklyn, N. Y.....	9
Graves, Dr. Arthur Harmount, Brooklyn, N. Y.....	1
Hinton, Mr. Martin H. C., London, England.....	1
Nakai, Dr. T., Tokyo, Japan.....	1
Orto Botanico della R. Università di Pisa, Pisa, Italy.....	1
Rensselaer Polytechnic Institute, Troy, N. Y.....	1
Weston, Dr. William H., Cambridge, Mass.....	1
Woodward, Miss Mary B., Brooklyn, N. Y.....	1
Total.....	16

AUTOGRAPH LETTERS

Gager, Dr. C. Stuart, Brooklyn, N. Y.....	33
---	----

MISCELLANEOUS

- Allen, Dr. C. E., Madison, Wisc. 1 Biblio-film strip
- Farriday, Mrs. Henry McKeen, New York, N. Y. 11 flower paintings by Mrs. Ellis Rowan
- Gager, Dr. C. Stuart, Brooklyn, N. Y. Collection of letters and Ms. notes; and historical material relating to the Brooklyn Botanic Garden (letters, papers, etc.)
- Mellen, Miss Ida, Brooklyn, N. Y. 2 sheets of pictures of New Zealand flowers
- Struckmann, Dr. Erick, København, Denmark. 1 Ms. extract of Danish Legislation on Protection of Nature
- Transylvania College, Lexington, Ky. 1 copy of Rafinesque letter from copperplate of original. In this letter Rafinesque accepts his appointment to the Professorship of Botany and Natural History in Transylvania University.

For the Department of Plants

Living Plants

- Becker, Mr. Herman, Brooklyn Botanic Garden, 6 species of orchids.
- Bernhardt, Dr. A., Brooklyn, N. Y., 1 *Opuntia ramosissima*.
- Bobbink & Atkins, Rutherford, N. J., 225 roses in 78 vars., 80 Pres. Macia.
- Crabtree, Mr. J. A., Montgomery, N. Y., 10 *Polemonium Van Bruntiae*.
- Craig, Mr. Wm. N., Weymouth, Mass., 4 *Anemone vernalis*.
- Crane, Dr. F. D., Winter Park, Fla., 4 species of plants from Florida.
- Currie, Dr. James N., Brooklyn, N. Y., 7 *Viola* species.
- Cutting, Mr. C. Suydam, New York, N. Y., 6 plants of *Rosa*, *Prunus*, *Syringa*.
- Davenport, Mr. Charles B., Cold Spring Harbor, L. I., 1 *Ginkgo biloba*.
- Dearborn, Mrs. Frederick, New York, N. Y., approximately 166 plants comprising twelve genera and species, through the Monadnock Garden Club of New Hampshire.
- Delisle, Dr. Albert L., Harvard University, 4 hybrids of *Aster novaeangliae* and *A. multiflorus*.
- Dreer, H. A., Inc., Philadelphia, Pa., 720 *Canna* plants in 36 varieties.
- Florida University, Gainesville, Fla., 1 pkg. *Tillandsia usneoides*.
- Free, Mr. Montague, Brooklyn Botanic Garden, 12 *Zingiber officinalis*.
- Gillies, Mr. G. H., Huntington, L. I., 6 Japanese chrysanthemums.
- Gilmore, Mr. Howard, Chesham, N. H., 1 *Polypodium vulgare* var. *cambrioides*.
- Hayward, Mr. Wyndham, Winter Park, Fla., 129 plants in 29 species and varieties.
- Ihrig, Mr. Paul P., Brooklyn, N. Y., 27 peony varieties.
- Ivey, Mr. G. F., Hickory, N. C., 24 *Pinus Taeda*, 6 *Nyssa sylvatica*.
- Jackson & Perkins, Newark, New York, 80 *Rosa Eclipse*, 80 *R. Signora*, 80 *R. Alice Harding* and 39 additional plants in 8 varieties.
- Jones, Mrs. Wallace, Brooklyn, N. Y., 1 *Selaginella lepidophylla*.
- Kelley, Mrs. H. A., St. Remy, N. Y., 22 herbaceous plants.

- La Frentz, Miss Olga, Brooklyn, N. Y., 3 varieties of *Bougainvillea*.
 McCloskey, Miss M., Children's Museum, Brooklyn, 6 cuttings of *Cydonia japonica*, pink form.
 McGovern, Mrs. J. W., New York, N. Y., 20 varieties of *Hedera helix*.
 Morrow, Mrs. Harry E., Hillsdale, N. Y., 1 *Angelica atropurpurea*.
 Orpet, Mr. E. O., Santa Barbara, Cal., 12 species and varieties of succulent plants.
 Princeton Nurseries, Princeton, N. J., 17 species of evergreens.
 Richards, Mrs. F. B., South Lyndeboro, N. H., 1 *Botrychium ciliaefolium*.
 Ripley, Mrs. Baillie, New York, N. Y., 59 local flora plants in five species and varieties, through the Litchfield Garden Club.
 Robbins, Mrs. Wm., Brooklyn, N. Y., 1 Wooden Rose (*Ipomoea*).
 Sanders, Mrs. F., Newtown High School, Elmhurst, L. I., 1 *Monstera deliciosa*.
 Scheepers, John, Inc., New York, N. Y., 1025 Gladiolus corms in 41 varieties.
 Senn, Mr. Harold A., Univ. of Virginia, Boyce, Va., 3 *Vanilla Eggersii*.
 Seymour, Rev. Frank C., Quincy, Mass., 9 *Arethusa bulbosa*.
 Sloan, Mr. Boyd L., Pasadena, Cal., 4 species of *Hoodia* and *Trichocaulon*.
 Spaid, Mr. M. J., Martindale, N. Y., 12 plants comprising 5 species of *Amarantaceae*.
 Steckler, Mr. Peter, Tucson, Ariz., 61 cacti and succulents in ten species and varieties.
 Stellwagen, Mr. Fred L., Brooklyn, N. Y., 4 peony varieties.
 Stumpp & Walter Co., New York, N. Y., 625 Gladioli corms in 25 varieties.
 Thoma, Mrs., Brooklyn, N. Y., 1 *Begonia Verschaffeltiana*.
 Tricker, Wm., Inc., Saddle River, N. J., 57 aquatic plants including 34 varieties of water lilies and species of *Hydrocleis* and *Pontederia*.
 Vestal, W. & Son, Little Rock, Ark., 108 plants of 18 species and varieties of roses.
 Zolotorfe, Mrs. S., Brooklyn, N. Y., 1 Avocado (*Persea gratissima*).

Seed Packets

Crane, Mr. F. D. (2)	Kittredge, Miss E. M. (1)
Cranford, Miss Margaret (2)	Logan, Mr. J. Harry (2)
Croizat, Dr. Leon (9)	Loines, Miss Hilda (10)
Elliott, Rev. E. A. (4)	Nally, Mr. Julian (1)
Harrison, Mrs. Stephen M. (1)	Sayles, Miss Harriet E. (1)
Hayward, Mr. Wyndham (1)	Spingarn, Mrs. J. E. (9)
Johnson, Mrs. First (3)	Steckler, Mr. Peter (1)
Jones, Mrs. Wallace (1)	White, Dr. O. E. (1)

Phanerogamic Herbarium

- Beals, Mr. A. T., 1 *Arthraxon hispidus* var. *cryptatherus*, representing an extension of range.
 Bowen, Mr. Leon W., 1 *Equisetum scirpoides* from New Jersey.
 Drushel, Dr. J. A., 134 specimens collected in eastern and southern United States.

- Fosberg, F. R. & V. O., 12 ferns collected in the Hawaiian Islands.
 Gilmore, Mr. Howard, 1 *Botrychium multifidum* var. *intermedium*.
 Hanmer, Mr. Charles C., 49 specimens collected in Nova Scotia.
 Jennings, Mr. D. Arthur, 4 *Pinus excelsa* and 2 *Cedrus Libani* from Long Island.
 Nally, Mr. Julian, 1 *Bambusa multiplex* var. and 2 *Dendrocalamus strictus* from Florida.
 Provost, Miss Eva M., 12 herbarium specimens.
 St. John, Mr. Edward P., 1 *Ophioglossum dendroideum*, 1 *Asplenium subtile*.
 Tryon, Mr. R. M., Jr., 6 *Dryopteris Goldiana* \times *D. marginalis*.
 Wagner, Mr. W. H., 1 *Polystichum acrostichoides*.
 Wiley, Miss F., 1 *Styrax Obassica*.

Cryptogamic Herbarium

- Peterson, Miss Grace A., Woodhaven, N. Y., 34 Powdery Mildews.

For the Department of Elementary Instruction

- A Friend, \$100.00 for the Endowment Fund for Children's Work.
 Boys and Girls Club, \$25.00 for the Endowment Fund for Children's Work.
 Butler, Mrs. Glentworth R., One prize cup competed for by the girls in the outdoor garden. One subscription to the Nature Magazine for the children's clubroom library.
 Degen, Mr. Charles, \$25.00 for the children's work.
 Fardelmann, Miss Margaret, One pamphlet and one book for the children's clubroom library.
 Gager, Mrs. C. Stuart, Two books for the children's garden library.
 Garden Teachers' Association, One prize cup competed for by the boys of the outdoor garden.
 Girls' Commercial High School, Maxwell Annex Class, \$1.00 for the children's garden house.
 Girls' Commercial High School, St. Mark's Annex Faculty, \$5.75 for the children's work.
 Gladstone, Mr. David, \$1.00 for the Endowment Fund for Children's Work.
 Goodman, Mr. and Mrs. Joseph, One cup competed for by the boys in the outdoor garden. Two and a half dozen calendars for use in children's classwork.
 Hammond, Miss Elsie, One book for the children's clubroom library. Two slides for use in classwork.
 Karshan, Mrs. Maxwell, \$3.00 for the Endowment Fund for Children's Work.
 Miner, Miss Frances M., One book for the children's clubroom library.
 Myerson, Misses Amy and Betty, One book for the children's clubroom library.
 Paulsen, Miss Gertrude M., 175 flower pots for greenhouse work.
 Pi Lambda Theta (Rho Chapter of New York University), \$15.00 for the children's clubroom library.

- Prendergast, Master Kevin, \$3.00 for the Endowment Fund for Children's Work.
- Public School Kindergarten Association, \$100.00 for the children's clubroom library in memory of Miss Jean Amos.
- Public School 90, Wooden implements for greenhouse work.
- Public School 225 Mothers' Club, One flower bowl for the Department.
- Public School 233 Parents' Association, \$5.00 for the children's garden.
- Raskin, Misses Ruthann and Vilma, \$2.00 for the Endowment Fund for Children's Work.
- Ridgway, Miss Beverly, \$5.00 for the Endowment Fund for Children's Work.
- Shaw, Miss Ellen Eddy, Two gold honor pins for service in the outdoor garden.
- Sherman, Master Julius, \$2.00 for the Endowment Fund for Children's Work.
- Sherwin, Misses Gladys and Jean, One book for the children's clubroom library.

Miscellaneous

- Brooklyn Citizen*, Brooklyn, 1 photograph of view in Japanese Garden.
- Mrs. Walter V. Cranford, Greenwich, Conn., 1 bronze statue, "Roses of Yesterday."
- Gilmore, Mr. Howard, Brookline, Mass., 2 photographs of *Polypodium virginianum* var. *cambricoides*.
- Mr. Bernhard Hoffman, Stockbridge, Mass., 1 truck load of limestone.
- Nally, Mr. Julian, Gotha, Fla., 2 photographs showing habit and fruit of *Dendrocalamus strictus*.
- Mr. Frederick W. Raetz, New York City, 3 photographs of views in Brooklyn Botanic Garden.
- Miss Helen Tillinghast, Vernon, Conn., 1 box of decorative gourds and ceremonial corn.
- Mr. V. L. Van Horne, Brooklyn, 21 small prints of views in the Japanese Garden.
- Miss Hilda Vilkomerson, Brooklyn, 7 specimens of fossil plants.
- Woman's Auxiliary of Brooklyn Botanic Garden, 1 ladle for punch bowl.

APPENDIX 2

PUBLICATIONS BY THE BOTANIC GARDEN PERSONNEL DURING 1937

Becker, Herman F.

- Xerophyte exhibit of the Brooklyn Botanic Garden at the
Twenty-fourth International Flower Show, March 15–20.
Cactus and Succulent Journal 8: 193–195 May.

Benedict, Ralph C.

- Visions and Visionaries in Science Education. *Teaching
Biologist* 6: 50–51, 61. January.

Review of Human Genetics and its Social Import. *Teaching Biologist* 6: 96–97. March.

Report of the Resident Investigator (Ferns) for 1936. *Brooklyn Bot. Gard. Record* 26: 97–98. April.

Review of A History of Science and Its Relations with Religion and Philosophy. *Teaching Biologist* 6: 117–118. April.

Review of Morphology of Vascular Plants: Lower Groups (Psilophytales to Filicales). *Amer. Fern Jour.* 27: 62–63. April–June.

Review of On the Types of Devaux's American Species of Ferns. *Amer. Fern Jour.* 27: 63–64. April–June.

Review of The Philippine Species of Selaginella. *Amer. Fern Jour.* 27: 64. April–June.

Philip Dowell (Dec. 3, 1864–June 25, 1936). *Amer. Fern Jour.* 27: 41. April–June.

A Projected Field Trip for Ferns at Owens, New Jersey. *Amer. Fern Jour.* 27: 106. July–September.

Bishop, George R.

Plants of xeric habitat. *Gardeners' Chronicle of America* 41: 223–224, 230; 262–263. August–September.

Brandwein, Paul C.

Experiments on latent infection of resistant varieties by the loose and covered smut of oats. *Bull. Torrey Bot. Club* 64: 433–444. October. (Reprinted as *Brooklyn Botanic Garden Contributions No. 78.*)

Caparn, Harold A.

The following articles have appeared in *Arts and Decoration*:
If you have roses. March.

Garden paths and how to make them. April.

What and why is a cutting garden? May.

A red spring garden. September.

Cheney, R. H.

Capillary blood sugar changes after caffeine. *Proc. J. Pharmacol. and Exper. Therap.* 60: 102. June.

New botany text title misleading. (A review of General and Economic Botany by E. E. Stanford.) *Jour. New York Bot. Gard.* 38: 244. October.

Myenteric activity modifications induced by caffeine. *Proc. Soc. Exp. Biol. & Med.* **37**: 572. December.

Dorward, Margaret M.

Planning next year's garden. *The Sun*. June 19.

Crocuses, snowdrops, and other little spring beauties. *The Sun*. September 11.

Free, Montague

Repotting and dividing house plants. *Horticulture*. P. 17. January.

Plants for rock gardens. *Horticultural Society of New York. Monthly Bulletin*. Pp. 12-14. January.

Report of the Horticulturist and Head Gardener for 1936. *Brooklyn Bot. Gard. Record* **26**: 81-85. April.

The Rock garden. *The Sun* (New York). April 10.

Gardening; a complete guide to garden making. Harcourt, Brace & Company, New York. 550 p.

Clematis man. *Country Gentleman* **107**: 17, 39. June.

Water gardens. *The Sun* (New York). June 5.

Plants for your parlor. *Little Gardens* **8**: 8-9, 24. Autumn (September).

Tulips for next spring's garden. *The Sun* (New York). September 25.

Foreword to North American Rock Plants by W. H. A. Preece. Macmillan Co., New York.

Narcissus. *The Sun* (New York). October 9.

New plants for your parlor. *Garden Digest* **9**: 23-26. October. (Condensed from Little Gardens).

Gager, C. Stuart

Foreword. *Your City Garden*, by McKenny and Seymour. Pp. v-viii. Appleton-Century. March.

Reply to Editorial in "The Truth Seeker," March 6, 1937. (Re Darwin's teaching on ancestry of man.) *The Truth Seeker* **64**: 214. April 17.

Botanic gardens in science and education. *Science* **85**: 393-399. April 23.

Twenty-sixth annual report of the Brooklyn Botanic Garden, 1936: Report of the director. *Brooklyn Bot. Gard. Record* 25: 11–39. April.

Botanic Gardens of the world: Materials for a history. *Brooklyn Bot. Gard. Record* 26: 149–353. July.

The New York State Museum: One hundred years young. 73rd Convocation, University of the State of New York, celebrating the 100th anniversary of the Division of Science and State Museum. *Abstract. The Univ. State of New York Bull. to the Schools* 24: 54–55. Nov. (Pub. in full, *Scientific Monthly*. Pp. 71–79. January, 1938.)

Graves, Arthur Harmount

Naturalized daffodils and other narcissus at the Brooklyn Botanic Garden. *The American Daffodil Year Book*. Pp. 27, 28. (May).

Common oak trees in winter. *School Nature League*. (New York City) *Bull.* 5 (Series 7). Pp. 1–3. January.

Botany. Revision service (for 1936). *Collier's National Encyclopedia*. Pp. 16, 17. April.

Chestnut breeding work in 1936. *Brooklyn Bot. Gard. Record* 26: 47–50. April.

Report of the Curator of Public Instruction for 1936. *Brooklyn Bot. Gard. Record* 26: 62–71. April.

Sunscald of tulip flowers. *Phytopathology* 27: 731–734. June.

The educational program at the Brooklyn Botanic Garden. *Bull. of the Brooklyn Institute of Arts and Sciences* 42²: 24, 25. September.

Making a new chestnut tree. *Radio Garden Club* 6 (Digest No. 73): 1–4. September.

Autumn berries at the botanic garden. *Bull. of the Brooklyn Institute of Arts and Sciences* 42⁵: 81. November.

Cedar and golden larch children. *Bull. of the Brooklyn Institute of Arts and Sciences* 42⁷: 129. December.

39 newspaper articles relating to the Brooklyn Botanic Garden.

Gundersen, Alfred

Report of the Curator of Plants for 1936. *Brooklyn Bot. Gard. Rec.* 26: 76–80. April.

Jordan, William E.

Report on the Library for 1936. *Brooklyn Bot. Gard. Record* 26: 92-96. April.

Marcy, D. Elizabeth

Inheritance of resistance to the loose and covered kernel smuts of sorghum. I. Dwarf Yellow Milo hybrids. *Bull. Torrey Bot. Club* 64: 209-228. April. (Reprinted as *Brooklyn Botanic Garden Contributions No. 75.*)

Inheritance of resistance to the loose and covered kernel smuts of sorghum. II. Feterita hybrids. *Bull. Torrey Bot. Club* 64: 245-267. May. (Reprinted as *Brooklyn Botanic Garden Contributions No. 76.*)

Merrill, Gertrude W.

Report of the Field Secretary for 1936. *Brooklyn Bot. Gard. Record* 26: 99-101. April.

Acetaria, a Discourse of Sallets, by John Evelyn F. R. S. *Bulletin of The Garden Club of America* 3: 87. May.

A rare old book reprinted. *Horticulture* 15: 13. July 1.

A quaint old herb book is reprinted. *Pennsylvania Gardens* 1: 20. September.

Miner, Frances M.

The following articles appeared in the *New York Herald Tribune* on the dates indicated:

Desert gardens for junior gardeners. January 10.

Citrous fruits. January 17.

Potatoes. January 24.

Junior gardeners prepare to plant. March 14.

Plans for an early vegetable garden. April 4.

Tools for junior gardeners. April 11.

Flowers and vegetables from the Mustard Family of plants. May 30.

Reed, George M.

Plant Pathology. *Brooklyn Bot. Gard. Record* 26: 39-44. April.

The Iris. *Brooklyn Bot. Gard. Record* 26: 45, 46. April.

Japanese and Siberian Iris. *The Sun* (New York). April 17.
 Japanese iris at Swan Lake Gardens, Sumter, S. C. *Amer.*
Iris Soc. Bull. **65**: 14,15. May.

Hana-shobu Society of Japan. *Amer. Iris Soc. Bull.* **65**:
 16, 17. May.

Reed, George M., and T. R. Stanton

Inheritance of resistance to loose and covered smuts in oat
 hybrids. *Jour. Amer. Soc. Agron.* **29**: 997-1006. De-
 cember.

Shaw, Ellen Eddy

Can gardens help us teach? *The Primary Teacher* **14**: 3-7.
 January-March.

Report of the Curator of Elementary Instruction. *Brooklyn*
Bot. Gard. Record **26**: 71-76. April.

Children's interests in science. *Schoolmen's Week Proceedings*,
Univ. of Pennsylvania Bull. **24**: 485-490. June.

The work of the Brooklyn Botanic Garden. *Nature Garden*
Guide **XVII**; No. 2. October.

The following 29 articles appeared in *The Sun* (New York)
 on the dates indicated:

How to make a desert garden. January 9.

Some 1937 flower selections. January 23.

Plants resistant to drought. January 30.

Plants for continuous bloom from March to frost. Febru-
 ary 13.

Plants that can take it. March 13.

Newer and better cornflowers. March 27.

For a good lawn. April 3.

Old favorites of the garden—phlox. April 10.

Our friends, the marigolds. April 17.

The vegetable garden. April 24.

Snapdragons and zinnias. May 1.

Enemies of the garden. May 8.

Don't forget the fall. May 15.

Our friends, the snapdragons. May 15.

Better buy plants. May 22.

Ground covers. May 29.

The June garden calendar. June 5.
 After blooming—what? June 12.
 Window gardens for the city. June 26.
 July in the garden. July 3.
 Checking on your garden. July 24.
 Starting perennials for next year's garden. July 31.
 The propagation of shrubs. August 14.
 Evergreens for small plots. August 21.
 Junior garden exhibits. August 28.
 September in the garden. September 18.
 Bulbs for indoor bloom. September 25.
 Seeds to buy for winter bloom. October 9.
 Fall work in the garden. October 9.

Svenson, Henry K.

Report of the Curator of the Herbarium for 1936. *Brooklyn Bot. Gard. Record* **26**: 86–91. April.
 Monograph of the Genus *Heuchera*. By Rosendahl, Butters & Lakela. Book review. *Torreya* **37**: 60–62. May–June.
 Monographic Studies in the Genus *Eleocharis* IV. *Rhodora* **39**: 210–231; 236–273. 6 pl., 21 maps. June–July. (Reprinted as *Brooklyn Bot. Gard. Contributions No. 77*.)
 The Wild Garden of the Brooklyn Botanic Garden—Local Flora Section. *Wild Flower* **14**: 42–45; 64–66. 6 plates. July–August.
 Did *Symphoricarpus albus* come originally from Canada? *Rhodora* **39**: 461–462. November.

Tilley, S. R.

Looking ahead in horticulture. *Gardeners' Chronicle of America* **41**: 135. May.
 Roses in a city garden. *American Rose Annual*. Pp. 159–160.

Utter, L. Gordon

The iris thrips and its control by hot water, with notes on other treatments. U. S. D. A. Circ. **445**: 1–12. October. (Authors Floyd F. Smith and L. G. Utter.) Reprinted as *Brooklyn Botanic Garden Contribution No. 79*.

APPENDIX 3

TALKS, LECTURES, ADDRESSES, AND PAPERS
GIVEN BY THE BOTANIC GARDEN
PERSONNEL DURING 1936**By the Director:**

- March 25. *Economic and cultural aspects of botany.* Adelphi College Assembly. Garden City, L. I.
- October 15. *The New York State Museum: one hundred years young.* The address for botanical science at the Seventy-third Convocation of the University of the State of New York, Celebrating the One Hundredth Anniversary of the Establishment of the Division of Science and State Museum. Albany, N. Y.
- December 14. *Science and religion.* Dutch Church Club, Flatbush.
- December 29. *Pandemic botany.* Address of retiring President. Botanical Society of America. Indianapolis, Indiana.

By the Curator of Public Instruction:

- March 15. *Improved lawns and yards for Flatbush.* South Midwood Residents' Association. Church of Nativity. Brooklyn.
- April 6. *Tree planting in New York City.* City Gardens Club. 598 Madison Avenue, New York City.
- April 22. *Breeding the American chestnut for disease resistance.* Class from Alexander Hamilton H. S. At the Garden.
- May 5. *The Chestnut problem.* Class from Brothers College. Drew University. Madison, N. J. At the Garden.
- May 15. *Breeding the chestnut.* Nature Study Group led by Mr. George T. Hastings. At the Garden.
- September 14. *Chestnut breeding.* Paper read at the 28th annual meeting of the Northern Nut Growers Association. Washington, D. C.
- October 11. *The maples and autumn coloration.* Children of Lawrence Street School. Hartford, Conn.
- October 20. *Breeding the chestnut.* Class from Brooklyn College. At the Garden.

October 21. *Breeding the chestnut.* Class from Brooklyn College. At the Garden.

November 4. *The deciduous habit and autumn coloration.* Biology Club of Alexander Hamilton H. S. At the Garden.

November 22. *Breeding the chestnut.* Class from Bishop McLaughlin Memorial H. S. At the Garden.

By the Curator of Elementary Instruction:

January 11. *Character training from nature study.* Mothers' Club, P. S. 241.

January 16. *Educational work of the Brooklyn Botanic Garden.* Rho Chapter, Pi Lambda Theta, New York University.

January 18. *Children's work at the Brooklyn Botanic Garden.* Mothers' Club, P. S. 193.

January 22. *Educational work at the Brooklyn Botanic Garden.* North End Club of New Haven.

January 26. *Graduation address.* P. S. 233.

January 28. *Graduation address.* P. S. 242.

January 29. *Plants and their care.* Congregational Home for the Aged.

February 8. *Junior gardening.* Elmira (N. Y.) Garden Club.

February 16. *Spring nature study.* Essex Fells (N. J.) Public School.

February 18. *Gardens.* Mothers' Club, P. S. 77, Queens.

February 18. *Plant study for schools.* The Association of Assistants to Principal, Queens.

February 27. *Testimonial speech in honor of Miss Eva C. Wood, Principal of P. S. 4.*

March 1. *The value of gardening for children.* Froebel Society of Brooklyn.

March 11. *Children's interests in science.* Schoolmen's Week Program, University of Pennsylvania.

March 12. *Nature projects.* Faculty of District School, Raleigh, N. C.

March 13. *The work of Junior Garden Clubs.* Course for Gardeners, University Extension Division, University of North Carolina.

- March 18. *Junior garden work.* Federated Garden Clubs of New York State.
- March 20. *Gardens for boys and girls.* Woman's College Club of York County, Pa.
- March 24. *Character qualities.* Arista Assembly, Girls' Commercial High School.
- March 31. *Spring garden operations.* Wanamaker's.
- April 6. *The Brooklyn Botanic Garden.* Two assemblies, P. S. 167.
- April 9. *Gardening for juniors.* Stamford (Conn.) Garden Center.
- April 12. *Gardens for boys and girls.* Parent-Teacher Association, Garden City (N. Y.) School.
- April 19. *The great plant world.* P. S. 91.
- April 20. *Nature work for children.* Faculty of Essex Fells (N. J.) Public School.
- April 24. *Education.* New Paltz State Normal School Reunion. At the Waldorf-Astoria.
- April 28. *Botanizing in your garden.* Plainfield (N. J.) Garden Club.
- May 3. *Garden flowers for spring and fall bloom.* Mothers' Club of Y. M. C. A. At the Garden.
- May 5. *The Brooklyn Botanic Garden and the Kindergarten Association.* Brooklyn Section, Public School Kindergarten Association. At the Garden.
- May 10. *Garden work for juniors.* Wilton (Conn.) Garden Club.
- May 12. *Botanizing in your garden.* Plainfield (N. J.) Garden Club.
- May 14. *The Brooklyn Botanic Garden.* P. S. 5.
- May 18. *Gardening in a recreational program.* National Recreation Association Congress, Atlantic City, N. J.
- June 2. *The Brooklyn Botanic Garden.* Girls' Commercial High School, Maxwell Annex.
- June 24. *Graduation address.* P. S. 167.
- September 14. *Plant propagation.* Garden Lovers Club of Middletown, N. Y.
- September 30. *Gardens for boys and girls.* School Garden Meeting, P. S. 201.

- October 2. *Educational values in children's gardening.* Class in Education from New York University. At the Garden.
- October 6. *Nature study in the life of a child.* Emmanuel Baptist Church.
- October 13. *The second discovery of America.* Girls' Commercial High School.
- October 18. *Plant propagation.* Garden Club of Madison (N. J.).
- October 25. *Everyday botany.* University High School, Columbia, S. C.
- October 26. *Junior garden work.* State Garden School, Extension Division, University of South Carolina, and Garden Club of South Carolina.
- October 26. *Junior garden work in the schools.* State Garden School, Extension Division, University of South Carolina, and Garden Club of South Carolina.
- October 28. *Children's garden work and conservation.* Rockland County Conservation Association, New City, N. Y.
- November 5. *Plants we use every day.* P. S. 3.
- November 10. *Gardening in education.* Rotary Club of Elizabeth, N. J.
- November 10. *The plant world.* Thomas Jefferson Senior and Junior High School, Elizabeth, N. J.
- November 20. *Classroom nature work.* Garden Club of New Jersey.
- November 22. *Thanksgiving, and greens for Christmas use.* Mothers' Club, P. S. 241.
- November 24. *Thanksgiving.* P. S. 155, Queens.
- November 24. *Thanksgiving,* P. S. 96, Queens.
- December 4. *Address.* Tufts College Alumni Meeting.
- December 15. *Myths and fables about holly and mistletoe.* P. S. 42.
- December 20. *The Brooklyn Botanic Garden.* Parent Teachers Association, P. S. 208.

By the Curator of Plant Pathology:

- March 23. *Gardens of Japan.* Kosmos Club. At the Garden.

- April 5. *Iris of Japan*. Trowel Garden Club, Washington, D. C.
- April 26. *Gardens of Japan*. Second District Meeting, Federated Garden Clubs of New York State, Inc., Bethpage Country Club, Long Island, N. Y.
- April 27. *Iris*. Valley Garden Club, Spring Valley, N. Y.
- May 8. *Japanese gardens*. Reconciliation Trips. At the Garden.
- June 5. *Beardless Iris*. Long Island Horticultural Society, Rockville Centre, Long Island, N. Y.
- October 28. *Gardens of Japan*. National Plant, Flower and Fruit Guild, Hotel Pennsylvania.

By the Curator of Plants:

- February 8. *Plant-animal interdependence in evolution*. Brooklyn Institute. (With charts by Miss Maud H. Purdy.)

By the Curator of the Herbarium:

- January 12. *Plant associations of the New York region*. Linnean Society of New York. American Museum of Natural History.
- January 20. *Spring flowers of the Cumberland region*. Torrey Botanical Club. New York Botanical Garden.
- May 4. *Plants of the Cumberlands*. Winter's Night Club. At the Garden.
- May 5. *Geology of the New York area*. The Local Flora Section. Students of Drew University. At the Garden.
- May 7. *Plants of the Cumberlands*. Brooklyn Botanic Garden staff. At the Garden.
- May 27. *Brooklyn Botanic Garden—Local Flora Section*. Brooklyn Nature Club. At the Garden.
- September 24. *Ecology of the New York region*. Brewster Garden Club, Brewster, New York.
- November 20. *Life of Linnaeus*. American Swedish Historical Museum, Philadelphia.
- December 7. *Botanic Gardens of Northern Europe*. Torrey Club, American Museum of Natural History.

December 30. *Distribution of the Genus Eleocharis*. Systematic Section, Botanical Society of America. Indianapolis.

By the Horticulturist:

January 5. *Gardens of England*. Wilde Open Air School. Brooklyn.

January 19. *Perennials*. Pennsylvania Horticultural Society. Philadelphia.

February 16. *Plant materials*. Junior League. New York City.

April 5. *Clematis*. Wilmington (Delaware) Garden Club.

April 14. *Gardening on two continents*. Horticultural Club of Boston.

April 29. *Roses* (afternoon lecture); *Gardening on two continents* (evening lecture). Akron (Ohio) Garden Club.

July 17. *Gardens for men*. Men's Garden Clubs of America. Lancaster, Pa.

August 4. *Autumn planting*. Bedford Garden Club. Mt. Kisco.

August 9. *Pruning*. Lake Mahopac (N. Y.) Garden Club.

November 1. *Clematis*. Connecticut Valley Garden Club. Hartford.

November 9. *Romance of plant life*. Garden Club of Schenectady.

December 7. *Beverages*. Wilde Open Air School. Brooklyn.

By the Librarian:

February 3. *Interesting items in the library collections*. Woman's Auxiliary annual luncheon. At the Garden.

May 20. *The Brooklyn Botanic Garden library*. Members of the Brooklyn Public Library Staff. At the Garden.

By the Assistant Curator of Elementary Instruction:

March 3. *Spring operations in the garden*. Mothers' Club, P. S. 134, Queens.

March 9. *Spring seed sowing*. Brooklyn Edison Garden Club.

March 17. *A Shakespeare Garden*. Woman's Club of Nutley, N. J.

April 16. *Spring flowers.* P. S. 156.

May 25. *Window box gardening.* Little Garden Club of Greenwich Village.

By Instructors:

Miss Hammond:

January 14. *Aids in nature study teaching.* New York Chapter, American Nature Study Society. At American Museum of Natural History.

March 22. *Nature projects and flower shows.* P. S. 82, Queens.

March 24. *Nature study projects.* Faculty of Essex Fells (N. J.) Public School.

March 31. *Conifers for the home grounds.* Tioronda and Cold Spring Garden Clubs, Beacon, N. Y.

April 7. *Birds.* P. S. 91.

April 20. *Along the nature trail.* Watchung Nature Club, Plainfield, N. J.

May 7. *Trees for use and beauty.* P. S. 20.

June 14. *A king's tree.* P. S. 142.

October 25. *Gardens under glass.* Bayside (N. Y.) Garden Club.

November 19. *The terrarium.* Nature Study Section, New York Society for the Experimental Study of Education.

Miss Miner:

January 15. *The Brooklyn Botanic Garden.* Old Greenwich (Conn.) Garden Club.

February 15. *Gardening with children.* P. S. 82, Queens.

March 18. *Awards in junior garden work.* Federated Garden Clubs of New York State.

April 26. *Spring flowers.* P. S. 91.

May 18. *Children's gardens.* Mothers' Club, P. S. 201.

Miss Rusk:

July 20. *Native ferns.* Summer Garden Institute, Rogers Rock, Lake George, New York.

July 21. *Native ferns.* Summer Garden Institute, Rogers Rock, Lake George, New York.

July 22. *Wild flowers.* Summer Garden Institute, Rogers Rock, Lake George, New York.

July 23. *Native orchids.* Summer Garden Institute, Rogers Rock, Lake George, New York.

August 16. *Native ferns.* Garden Club of Jamestown, Rhode Island.

October 19. *Breeding disease-resistant chestnut trees.* To Biology class from Brooklyn College: At the Garden.

By Curatorial Assistant (Miss Vilkomerson):

August 11. *The educational work of the Brooklyn Botanic Garden.* New York University School of Education. At the Garden.

October 18. *Breeding disease-resistant chestnut trees.* Class from Brooklyn College. At the Garden.

December 7. *Chestnut breeding.* Hunter College Biology Club. Hunter College.

By the Field Secretary:

January 27. *Flower arrangement.* Tourist Club, Towers Hotel, Brooklyn.

February 3. *The Brooklyn Botanic Garden.* Garden Clubs of the Tenth District, Madison, New Jersey.

February 8. *The Brooklyn Botanic Garden.* Monday Culture Club. At the Garden.

February 17. *Japanese flower arrangement for western homes.* Wanamakers, New York.

February 18. *Planning a terrarium.* Mothers' Club of Central Congregational Church, Brooklyn.

April 20. *The Japanese Garden.* Classon Avenue Presbyterian Church, Brooklyn.

April 26. *The Reprint of Evelyn's "Acetaria."* Conference of Long Island Garden Clubs, Farmingdale, N. Y.

May 7. *The Activities of Brooklyn Botanic Garden.* Contemporary Club of Newark. At the Garden.

May 17. *The Activities of the Botanic Garden.* Passaic Valley Garden Club. At the Garden.

May 18. *Aspects of flower arrangement.* Wellesley Club. At the Garden.

May 20. *The Brooklyn Botanic Garden.* Brooklyn Public Library Grade Conference. At the Garden.

May 24. *The Brooklyn Botanic Garden.* Bay Ridge Garden Club. At the Garden.

June 14. *The Brooklyn Botanic Garden.* East Rockaway-Cedarhurst Garden Club. At the Garden.

September 23. *The Brooklyn Botanic Garden.* Beverly Presbyterian Church, Brooklyn.

October 25. *Aspects of linear flower arrangement.* Passaic Valley Garden Club. Montclair, N. J.

November 23. *Flowers for home decoration.* Woman's Guild. Central Congregational Church, Brooklyn.

By the Resident Investigator (Economic Plants):

March 17. *Morphology and chemistry of the coffee fruit in relation to beverage quality.* Torrey Botanical Club, New York Botanical Garden, New York City.

October 19. *North American beverage plants.* Brooklyn Institute of Arts and Sciences (Department of Botany), Brooklyn Botanic Garden.

December 29. *Beverage plants of the United States.* National Convention of the Virginia Dare Extract and Syrup Co., Inc., Bush Terminal, Brooklyn

By the Foreman Gardener (George R. Bishop):

February 10. *Plant propagation.* Bedford Park Presbyterian Church, Brooklyn.

March 29. *Plant propagation.* Woodridge (N. J.) Presbyterian Church.

July 13. *Activities in the flower and vegetable garden during the summer months.* Brooklyn Edison Garden Association.

By the Gardener in Charge of the Rose Garden (S. R. Tilley):

June 8. *Through the year with the roses.* At the Garden.

September 14. *Roses.* Brooklyn Edison Garden Association.

By the Custodian:

May 27. Brooklyn Nature Club. Local Flora, Brooklyn Botanic Garden.

June 7. Tree identification. Westfield (N. J.) Bird Club.

August 18. General botany. Camp Rosemartin, Stillwater, N. J.

APPENDIX 4

RADIO TALKS BY THE BOTANIC GARDEN
PERSONNEL DURING 1937**By the Horticulturist:***From Station WOR:*

- January 12. House plants for the New Year.
- February 9. Carpet plants.
- March 19. The Brooklyn Botanic Garden Exhibit at the International Flower Show, New York City.
- March 26. Fussing with grass.
- April 13. Gardening on the rocks.
- June 8. Roses that survive.
- July 23. Barbering climbing roses.
- July 27. Introducing Professor Hortus.
- August 24. The Conifers are coming.
- September 28. Professor Hortus tells all!
- November 19. Plants from sticks.
- December 31. Professor Hortus keeps New Year's Eve.

From Station WNYC:

- January 29. Winter pruning.
- March 5. The story of the tulip.
- April 16. Plant trees, shrubs and evergreens.
- May 28. Water gardens.
- November 26. Berries and shrubs as decorative material.

By the Curator of Public Instruction:*From Station WMCA:*

- March 17. The Brooklyn Botanic Garden exhibit of xerophytes at the International Flower Show, New York City.

From Station WOR:

- September 24. Making a new chestnut tree.

From Station WNYC:

- March 19. Early spring flowers at the Brooklyn Botanic Garden.
- April 30. Spring flowers at the Brooklyn Botanic Garden.
- June 11. A visit to the Brooklyn Botanic Garden.

By the Curator of Elementary Instruction:*From Station WNYC:*

January 15. What to do with our Christmas plants.

February 26. Starting seed for the outdoor garden.

April 2. Gardens for boys and girls.

May 14. The upkeep of the garden.

December 24. Christmas myths and fables in relation to Christmas greens.

From Station WOR:

December 14. Filling the gardener's Christmas stocking.

By Instructor (Miss Miner):*From Station WIIN:*

March 23. Spring gardening.

From Station WNYC:

June 25. Summer garden work for boys and girls.

By the Assistant in Woody Plants:*From Station WNYC:*

February 12. Early flowering trees and shrubs.

November 12. Shrubs for border planting.

From Station WOR:

May 11. Oriental beauties.

APPENDIX 5**FIELD TRIPS CONDUCTED, 1937****By the Curator of Public Instruction:**

September 12. Torrey Botanical Club. Manitou, N. Y.

By the Curator of Plants:

May 16. Torrey Botanical Club. Lilac collection at the Brooklyn Botanic Garden.

August 6–8. Gundersen, Alfred & Dr. Lloyd Ryder. Torrey Botanical Club. To Mt. Marcy, Adirondacks.

By Instructor (Hester M. Rusk):

June 5. New York Association of Biology Teachers. Atlantic Highlands, New Jersey.

July 21. Summer Garden Institute, Rogers Rock, Lake George, New York.

July 22. Summer Garden Institute, Rogers Rock, Lake George, New York.

July 23. Summer Garden Institute, Rogers Rock, Lake George, New York.

July 24. Summer Garden Institute, Rogers Rock, Lake George, New York.

By the Assistant in Woody Plants:

May 22. Torrey Botanical Club. Field meeting at the Brooklyn Botanic Garden.

By the Resident Investigator (Ferns):

September 26. American Fern Society and Torrey Botanical Club. Owens, New Jersey.

By Curatorial Assistant (Hilda Vilkomerson):

April 24. Torrey Botanical Club. Brooklyn Botanic Garden.

June 5. New York Association of Biology Teachers. Atlantic Highlands, New Jersey.

By the Custodian:

November 14. Brooklyn Nature Club. Winter botany.

December 12. Brooklyn Nature Club. Trees, their bark, form, twigs, buds, and habits.

APPENDIX 6

ORGANIZATIONS MEETING AT THE GARDEN, 1937

January 9. Brooklyn College biology class.

January 30. New York High School Biology Teachers.

February 3. Woman's Auxiliary, Brooklyn Botanic Garden, annual luncheon.

February 8. Monday Culture Charity Club.

February 27. New York High School Biology Teachers.

March 3. Department of Botany, Brooklyn Institute of Arts and Sciences.

March 23. Kosmos Club of Brooklyn.

April 6. Woman's Auxiliary, Brooklyn Botanic Garden.

- April 16. Fortnightly Club.
 April 21. Torrey Botanical Club.
 April 24. Torrey Botanical Club. (Dr. Gundersen on grounds.)
 May 3. Mothers' Club, Flatbush Y. M. C. A.
 May 4. Winters Night Club.
 May 5. Brooklyn Kindergarten Association.
 May 5. D. A. R. Women of '76 Chapter.
 May 7. Garden Club of New Rochelle.
 May 7. Newark (N. J.) Contemporary Garden Club.
 May 8. Reconciliation Trips, Inc.
 May 13. Contemporary Club of Brooklyn.
 May 13. Woman's Auxiliary, New York Botanical Garden.
 May 17. American Fern Society.
 May 17. Torrey Botanical Club.
 May 17. Passaic Valley Garden Club.
 May 18. Brooklyn Wellesley Club.
 May 20. Brooklyn Public Library Grade Conference.
 May 21. Dutch Church Club.
 May 24. Bay Ridge Garden Club.
 May 24. Brooklyn Nature Club.
 June 14. East Rockaway—Linbrook Garden Club.
 June 22. Biology Alumni of Brooklyn College.
 July 10. Reconciliation Trips, Inc.
 October 2. Reconciliation Trips, Inc.
 October 19. Department of Botany, Brooklyn Institute of Arts
 and Sciences.
 November 14. Brooklyn Nature Club.
 34 Organizations. Total attendance, 1268.

APPENDIX 7

REPORT OF PHOTOGRAPHIC WORK

Negatives on file December 31, 1936.....	9,306
Negatives accessioned during 1937.....	276
Total negatives on file December 31, 1937.....	9,582
Lantern slides on file December 31, 1936.....	6,511
Lantern slides accessioned during 1937.....	217
Total lantern slides on file December 31, 1937.....	6,728

Prints on file December 31, 1936	6,982
Prints made during 1937	967
Used or distributed	690
Prints filed during 1937	277
	<hr/>
Total prints on file December 31, 1937	7,259
Enlargements made	53
Motion pictures made	8 reels

All photographic work is by Mr. Louis Buhle, staff photographer, and all halftone reproductions in Brooklyn Botanic Garden publications are from photographs by Mr. Buhle unless otherwise designated.

APPENDIX 8

REPORT ON BROOKLYN BOTANIC GARDEN PUBLICATIONS, 1937

Ecology

Official Organ of the Ecological Society of America

Quarterly. Volume XVIII comprised 37 papers (besides reviews, proceedings, and miscellaneous matter), 560 pages and 118 text figures (as against 45 papers, 714 pages and 185 text figures in 1936). The circulation at the close of the fiscal year (November 30, 1937) was 1,041 as against 1,086 one year ago.

The annual budget was \$4,381.10, the credit balance \$215.44, and assets over liabilities \$304.74 (as against \$5,773.81, \$448.49, and \$601.34 assets over liabilities in 1936), plus the value of back sets and volumes on hand. Dr. Henry K. Svenson continued on the editorial board as the Brooklyn Botanic Garden representative. Prof. Alfred E. Emerson and Prof. George D. Fuller, both of the University of Chicago, continued as Editors.

Genetics

In Cooperation with the Editorial Board of Genetics

Bimonthly. Volume XXII comprised 46 papers, 663 pages, 5 plates, and 84 text figures (as against 44 papers, 855 pages, 5 plates, and 152 text figures in 1936). At the close of the fiscal year (November 30, 1937) the circulation was 770, the annual budget \$8,830.02, and the credit balance \$4,118.35 (as against 726, \$10,586.16, and \$3,647.13 in 1936), plus the value of back

sets and volumes on hand. Dr. L. C. Dunn, of Columbia University, continued as Managing Editor.

Brooklyn Botanic Garden Record

Quarterly. Volume XXVI comprised 375 pages. The April number comprised the Annual Report. The circulation of the Record at the close of the year was 1,499.

Leaflets

No Leaflet was issued during 1937.

Contributions and Memoirs

Numbers 75, 76, 77, 78, 79, and 81 of the *Contributions* were published.

No *Memoir* was published.

OFFICERS OF THE BOARD OF TRUSTEES

PRESIDENT

EDWARD C. BLUM

FIRST VICE-PRESIDENT

WALTER H. CRITTENDEN

SECOND VICE-PRESIDENT

ADRIAN VAN SINDEREN

THIRD VICE-PRESIDENT

SUMNER FORD

TREASURER

EDWIN P. MAYNARD

SECRETARY

JOHN H. DENBIGH

BOTANIC GARDEN GOVERNING COMMITTEE

MISS HILDA LOINES, CHAIRMAN

PHILIP A. BENSON

EDWARD C. BLUM, *Ex officio*

MRS. WILLIAM H. CARY

WALTER H. CRITTENDEN

MRS. LEWIS W. FRANCIS

WALTER HAMMITT

WILLIAM T. HUNTER

DAVID H. LANMAN

EDWIN P. MAYNARD

ALFRED E. MUDGE

EX OFFICIO MEMBERS OF THE BOARD

THE FOLLOWING OFFICIALS OF THE CITY OF NEW YORK

THE MAYOR

THE COMPTROLLER

THE COMMISSIONER OF PARKS

MEMBERS OF THE BOARD

(Trustees are Elected from Membership of the Brooklyn Institute of Arts and Sciences)

Babbott, Dr. Frank L.

Bayes, Hon. William R.

Beers, E. LeGrand

Benson, Philip A.

Blum, Edward C.

Blum, Robert E.

Cary, Mrs. William H.

Christy, Francis T.

Crittenden, Walter H.

Curtin, John J.

Davidson, Sidney W.

Denbigh, Dr. John H.

Dillon, Miss Mary E.

Draper, Mrs. Mary Childs

Farrell, James A.

Ford, Sumner

Forward, DeWitt A.

Francis, Mrs. Lewis W.

Frazier, Kenneth

Good, Mrs. William H.

Hammitt, Walter
 Healy, Mrs. A. Augustus
 Hunter, William T.
 Ingraham, Henry A.
 Jonas, Ralph
 Lanman, David H.
 Lewisohn, Sam A.
 Lockwood, Luke Vincent
 Loines, Miss Hilda
 Maynard, Edwin P.
 McLaughlin, Hon. George V.
 Mudge, Alfred E.

Murray, Thomas E., Jr.
 Osborne, Mrs. Dean C.
 Parker, John C.
 *Post, James H.
 Pratt, Charles
 Pratt, Mrs. Frederic B.
 Shaw, Robert Alfred
 Smith, Dr. Bernard H.
 *Underwood, John T.
 Van Sinderen, Adrian
 Warner, Dr. Edwin G.
 York, Rt. Rev. Mgr. John C.

WOMAN'S AUXILIARY

MRS. GLENTWORTH R. BUTLER, HONORARY PRESIDENT
 MRS. HENRY J. DAVENPORT, PRESIDENT
 Mrs. Irving L. Cabot, Vice-President
 Mrs. George E. Brower, Secretary
 Miss Jessie H. Righter, Treasurer

Allen, Mrs. Joseph Dana
 Arai, Mrs. R.
 Babbott, Mrs. Frank L.
 Benson, Mrs. Philip A.
 Betts, Miss Dorothy L.
 Blum, Mrs. Edward Charles
 Boardman, Mrs. George M.
 Braman, Miss Emily L.
 Braman, Miss Irene M.
 Brewster, Mrs. Walter Shaw
 Brinsmade, Miss Alice
 Brower, Mrs. George E.
 Brown, Mrs. G. Stewart
 Brown, Mrs. Samuel A.
 Butler, Mrs. Glentworth R.
 Butterick, Miss Mary E.
 Cabot, Mrs. Irving L.
 Carroll, Mrs. Otis Swan
 Carter, Mrs. Oliver Goldsmith
 Cary, Mrs. William H.
 Childs, Mrs. William H.
 Christy, Mrs. Francis T.
 Coutts, Miss Frances H.
 Cranford, Mrs. Frederick L.
 Cranford, Mrs. Walter V.

Cruikshank, Mrs. Russell V.
 Davenport, Mrs. Henry J.
 Delafield, Mrs. John R.
 Draper, Mrs. Mary Childs
 Dreier, Mrs. H. Edward
 Eidlitz, Mrs. Ernest Frederick
 Ford, Mrs. Sumner
 Francis, Mrs. Lewis W.
 Frank, Mrs. George S.
 Gager, Mrs. C. Stuart
 Garvin, Mrs. Edwin L.
 Goetze, Mrs. Otto
 Good, Mrs. William H.
 Greenman, Mrs. William B.
 Hammitt, Mrs. Walter
 Harrison, Mrs. Stephen M.
 Healy, Mrs. A. Augustus
 Hill, Mrs. Robert C.
 Hills, Mrs. James M.
 Huff, Mrs. Earle P.
 Hume, Mrs. Russell S.
 Hyde, Mrs. Clarence R.
 Ingersoll, Mrs. Raymond V.
 Ingraham, Mrs. Henry A.
 James, Mrs. Darwin R., Jr.

* Deceased.

Jameson, Miss Jeanetta C.	Post, Miss Jessie W.
Jameson, Mrs. P. Chalmers	Potts, Mrs. Charles E.
Jennings, Mrs. John E.	Pratt, Mrs. Frederic B.
Jonas, Mrs. Ralph	Pratt, Mrs. Richardson
Jones, Miss Helen Swift	Prince, Mrs. Benjamin
Knox, Miss Maria	Putnam, Mrs. William A.
Lanman, Mrs. David H.	Richter, Miss Jessie H.
Lathrop, Mrs. John H.	Roberts, Mrs. John S.
Leech, Mrs. John E.	Rowe, Mrs. Frederick W.
Lester, Mrs. Maxwell	Seabury, Mrs. Samuel
Lincoln, Mrs. Roy M.	Shaw, Mrs. Awbrey N.
Lockwood, Mrs. William A.	Shaw, Miss Ellen Eddy
Loines, Miss Hilda	Sherman, Mrs. Arnold W.
Mark, Mrs. Henry A.	Simmons, Mrs. Frank E.
Marshall, Mrs. William W.	Smith, Mrs. B. Herbert
Maynard, Mrs. Edwin P.	Southard, Miss Edith Brett
Maynard, Mrs. Edwin P., Jr.	Stewart, Mrs. Seth Thayer
McMahon, Mrs. Edward W.	Stutzer, Miss Elise W.
Merrill, Mrs. Whitney W.	Thatcher, Mrs. Edwin H.
Mudge, Mrs. Alfred E.	Thayer, Mrs. Gordon C.
Noble, Mrs. Francis L.	Truslow, Mrs. Walter
O'Donohue, Mrs. Charles A.	Tuttle, Mrs. Winthrop M.
Osborne, Mrs. Dean C.	Underwood, Mrs. John T.
Otis, Mrs. Charles H.	Van Brunt, Miss Elizabeth R.
Paffard, Mrs. Frederic C.	Van Brunt, Mrs. Jeremiah R.
Palmer, Mrs. Carleton H.	Van Sinderen, Mrs. Adrian
Parsons, Mrs. Frank H.	Warbasse, Mrs. James P.
Pashley, Mrs. Charles L.	Wells, Mrs. Walter F.
Peck, Mrs. Bayard L.	White, Mrs. Alexander M.
Perkins, Mrs. Charles E.	White, Miss Harriet H.
Perry, Mrs. John M.	Wilcox, Mrs. T. Ferdinand
Peters, Mrs. Wm. Sterling	Wilson, Mrs. Francis A.
Phenix, Mrs. Spencer	Woodward, Miss Mary Blackburne

LIST OF MEMBERS

(Revised to April 7, 1938)

For information concerning the various classes of membership consult the pages preceding this Report

BENEFACTORS

By contribution of \$100,000 or more, or by gifts of equivalent value

*Samuel P. Avery
*Carl H. De Silver

*Augustus Graham
*A. Augustus Healy

*Alfred T. White (G) ¹
 *Miss Frances E. White (G)

Miss Harriet H. White (G)
 *Robert B. Woodward

PATRONS

By contribution of \$25,000 or more, or by gifts of equivalent value

*Frank L. Babbott	*Alfred W. Jenkins
*Miss Mary Benson	*Frank S. Jones
Miss Elisabeth W. Frothingham	*Alfred Duane Pell
*Edwin Gould (G)	*Mrs. Caroline H. Polhemus
*Edward L. Graef	*William A. Putnam
*Mrs. John Hills (G)	*Charles A. Schieren
	*John T. Underwood

DONORS

By contribution of \$10,000 or more, or by gifts of equivalent value

*Abraham Abraham	Joseph C. Hoagland
Dr. Frank L. Babbott	*Samuel N. Hoyt
*Henry Batterman	Mrs. Mary Babbott Ladd
*James A. H. Bell	Mrs. Joseph H. Lester
*Mrs. Eugene G. Blackford	*Frederick Loeser
*William Calverly	Mrs. Ian MacDonald
*William H. Cary	*Henry P. Martin
Mrs. William H. Childs	*Miss Matilda McLean
*Walter V. Cranford (G)	*Joseph T. Perkins
Mrs. Walter V. Cranford (G)	*George D. Pratt
Walter H. Crittenden	*Henry K. Sheldon
*Mrs. Ella J. Filson	Mrs. Lydia Babbott Stokes
*John W. Frothingham	*Herman Stutzer (G)
*George A. Hearn	*Hon. Richard Young (G)

PERMANENT MEMBERS

By contribution of \$2,500 or more, or by gifts of equivalent value

Abraham, Mrs. Abraham	Beers, Dr. Nathan T.
Barclay, Mrs. Reginald	*Benedict, Henry Harper
Barnes, Mrs. Richard S.	Blackford, Eugene G.
Beers, E. LeGrand	Blum, Edward C.
Beers, Miss M. Elizabeth	Boocock, Murray
*Beers, Mrs. Mary L.	*Boody, Hon. David A.

¹ (G), through the Botanic Garden. For names not thus designated the gifts were to some other Department of the Brooklyn Institute of Arts and Sciences.

- | | |
|--------------------------------|-----------------------------|
| *Brackett, Miss Mary A. | Joost, Mrs. Martin |
| Brown, Mrs. Lilla | Kelso, William G., Jr. |
| Campbell, Miss Mary | *Lawrence, Henry C. |
| Carroll, Mrs. Otis Swan | *Lawrence, Lysander W. |
| *Coffin, Mrs. Sturgis | Lawrence, Richard H. |
| *Cook, Henry F. | Lindgrove, Mrs. Marjorie S. |
| Day, Prof. Cyrus Lawrence | *Lord, Mrs. John Bradley |
| English, Mrs. J. Radford | Low, A. Augustus |
| *Evans, Miss Mabel Louise | *Maxwell, J. Rogers, Jr. |
| Fahys, George E. | McMahon, Joseph T. |
| *Fahys, Joseph | *Morse, Horace J. |
| First Unitarian Church Society | *Oakley, Mrs. Theodora L. |
| *Freifeld, Mrs. George | *Olcott, George M. |
| Good, Mrs. John, Sr. | *Palmer, Lowell M. |
| *Gottsberger, Francis | *Peabody, George Foster |
| *Healy, Frank | Pell, Mrs. Cornelia L. |
| *Hearn, Mrs. George A. | *Post, James H. |
| *Hentz, Henry | Powell, Mrs. Robert E. |
| *Herriman, Miss Helen | Sanger, William |
| Higgins, Tracy | *Sanger, William Cary |
| Hoagland, Mrs. Raymond | Self, Mrs. Edgar A. |
| Hoagland, Miss S. W. | *Sheldon, Mrs. Henry K. |
| Hodenpyl, Eugene, Jr. | Simonds, Mrs. William R. |
| How, Miss Josephine W. | Smith, Mrs. Annie Morrill |
| Hoyt, Mrs. Mark | Smith, Howard C. |
| Hughes, Miss Celeste | *Vander Weyde, Mrs. N. J. |
| Hughes, Miss Mary | Walsh, Mrs. Anna F. |
| *James, John S. | Webster, Miss Aileen |
| *Jones, Mrs. Mary L. | *White, Alexander M. |
| *Jones, Townsend | *Woodward, Mrs. John B. |

LIFE MEMBERS

By contribution of \$500 or more, or by gifts of equivalent value

Through the Botanic Garden

- | | |
|---|--------------------------|
| Bailey, Frank | Hicks, Henry |
| Bobbink, Lambertus C. | Hunter, William T. |
| Butler, Mrs. Glentworth R. (In
memory of Dr. Glentworth R.
Butler.) | Jonas, Ralph |
| Cary, Mrs. William H. | Loines, Miss Hilda |
| Childs, Eversley | Mudge, Alfred E. |
| Engelhardt, George P. | Osman, Fred D. |
| Gager, Dr. C. Stuart | Perkins, Mrs. Charles E. |
| | Potts, Maj. Charles E. |
| | Southwick, Dr. E. B. |
| | Thatcher, Edwin H. |

Through other Departments of the Institute

- | | |
|---------------------------------|------------------------------------|
| Abraham, Lawrence E. | Dreier, Theodore |
| Ager, John Winifred | Dykeman, Conrad V. |
| Albertson, Rev. Charles Carroll | *Eastman, Mrs. William F. |
| Allan, Mrs. Evelyn W. | Elmhirst, Mrs. Dorothy P. Whitney |
| Allen, Miss Mary W. | English, George L. |
| Banbury, James J. | Evans, Mrs. Gertrude C. |
| Bannister, Miss Eleanor C. | Fara Forni, Mme. A. F. |
| Batterman, Charles H. | Farmer, Walter B. |
| Batterman, Henry L. | Farrell, James A. |
| Batterman, Miss Minnie P. | Farrier, Albert Moses |
| Baxter, F. W. | Farrier, Frederick B. |
| Bayes, Hon. William R. | Ferrier, Miss Elizabeth A. |
| Baylis, A. B. | Field, Miss E. Elizabeth |
| Baylis, Wm., Jr. | Fish, Mrs. L. W. |
| Benson, Philip A. | Flagg, Mrs. Montague |
| Bigelow, Edward F. | Flinsch, Rudolph E. F. |
| Blumenthal, Maurice | Foote, Alfred Sherman |
| Blydenburgh, Frank J. | Ford, Sumner |
| Bolwell, Mrs. Sarah A. | Francis, Mrs. Lewis W. |
| Boody, Alvin | Francken-Sierstorpff, Countess von |
| Brasher, Philip | Frank, Mrs. George S. |
| Brasher, Reginald I. | Frazier, Kenneth |
| Brockway, Miss Emma A. | Frothingham, Miss Helen H. |
| *Brown, Miss A. W. | Gardner, William |
| Brown, John W. | Gibb, William T. |
| Buek, Mrs. Cecilia | Gifford, Ira L. |
| Campbell, Mrs. Wm. Mitchell | Gilbert, Miss A. Louise M. |
| Chauncey, Rev. E. F. | Gilbert, William T. |
| Chittenden, Miss Alice H. | Good, Mrs. John, Jr. |
| Claflin, John | Good, Mrs. William H. |
| Clarke, Rev. L. Mason | Goodnow, David F. |
| Corlies, Howard | Goodnow, Prof. Frank J. |
| Cram, Mrs. Howard W. | Goodnow, Weston W. |
| Crane, Judge Frederick E. | Grace Church (Brooklyn) |
| *Cunningham, Mrs. F. W. | Hall, Charles H. |
| Curtin, John J. | *Halsey, William B. |
| Curtis, Henry S. | Healy, Mrs. A. Augustus |
| Dalby, Archibald B. | Heckscher, August |
| Davis, William T. | Hester, Mrs. Ada Gibb |
| Denbigh, Dr. John H. | Hill, William B. |
| Dixon, Theodore P. | Hollenback, Miss Amelia B. |
| Dougherty, Andrew, Jr. | Hooker, Dr. Davenport |
| Doyle, Mrs. Allan M. | *Hooper, Mrs. Franklin W. |
| Draper, Ernest G. | Huber, Joseph |
| Draper, Mrs. Mary Childs | Hulbert, Mrs. Henry C. |

- Husson, Miss C. Julie M.
 Hyde, Henry St. John
 Hyde, James H.
 Ingraham, Miss Frances
 Ingraham, George S.
 Jeffrey, Dr. Stewart L.
 Johnson, Alvin R.
 Jones, Miss Emily W.
 Kahn, Mrs. Otto
 Kelekian, Dikran G.
 Kellogg, Dwight H.
 Kennedy, Mrs. Mary A.
 Kenyon, Mrs. Irene S.
 Kenyon, Whitman W.
 Lang, Mrs. Robert
 Latimer, Miss Julia W.
 Lewisohn, Adolph
 Lewisohn, Sam A.
 Lincoln, Mrs. Dorothy Chapel
 Litchfield, E. Hubert
 Lockwood, Luke Vincent
 Love, Mrs. Henry D.
 Low, Ethelbert Ide
 Low, Josiah O.
 Ludlum, Clinton W.
 Lyman, Frank
 Lynde, Mrs. Martha R.
 Macbeth, Robert W.
 MacDonald, Rev. Robert
 Mason, William P.
 Mathews, Mrs. Albert H.
 Maxwell, Henry L.
 May, Joseph M.
 Maynard, Edwin P.
 McAneny, Hon. George
 McConnell, Rev. S. D.
 *McKay, Mrs. John S.
 McLaughlin, Hon. George V.
 Melish, Rev. John H.
 Metcalf, Jesse
 Moffat, David
 Moffat, William L.
 Moore, Mrs. W. H.
 Morgan, John Hill
 Morse, Miss Alice L.
 Morse, Charles L.
 Mundhenk, Herman
 Murray, Thomas E., Jr.
 O'Connor, Mrs. W. B.
 Ogilvie, Donald Manson
 Osborne, Mrs. Dean C.
 Packard, Miss Mary S.
 Paige, Clifford E.
 Palmer, Henry L.
 Parker, Asa W., Jr.
 *Parker, Gordon
 Parker, John C.
 Peet, Mrs. Louis Harman
 Pierrepont, John J.
 Pierrepont, Seth Low
 Polhemus, Miss R. A.
 Potts, Maj. Charles E.
 Pratt, Charles
 Pratt, Frederic B.
 Pratt, Mrs. Frederic B.
 Pratt, Harold I.
 Prentiss, Russell E.
 Prosser, Thomas Harold
 Prosser, Walter R.
 *Putnam, Harrington
 Putnam, Mrs. William A.
 Ramsdell, Mrs. F. Van N.
 Robinson, George C.
 Robinson, Dr. Nathaniel
 Ruger, Mrs. Adolph
 Ruscoe, Miss Rose
 Russell, James T., Jr.
 Russell, Mrs. Talcott H.
 Sanbern, Mrs. Frank H.
 Schenck, Miss Eunice M.
 Schieren, Harrie Victor
 Shaw, Robert Alfred
 Sheldon, Mrs. Anna B.
 Sheldon, Henry
 Smith, G. Foster
 Smith, Mrs. Helen Ward
 Snow, Helmer
 Squier, Frank
 Stevens, Mrs. Roy G.
 Stevens, Shepherd
 Stewart, Douglas MacC.

Stutzer, Miss Elise W.	Van Sinderen, Mrs. Adrian
Sullivan, Andrew T.	Wagner, Miss Marie
Taylor, Miss Bessie	Walbridge, Robert R.
Taylor, Mrs. Helen S.	Warbasse, Mrs. James P.
Taylor, William H.	Warner, Dr. Edwin G.
Thayer, Mrs. Anna K.	Weber, Mrs. Herman C.
Thursby, Miss Ina	Webster, Mrs. Edward H.
Tucker, Mrs. George S., Jr.	White, Harold T.
Turner, Mrs. Bertha C.	White, S. V.
Tuthill, Miss Isabel H.	Whitney, Sumner B.
Valentine, P. A.	Wisner, Mrs. Horatio S.
Van Anden, Miss Susan M.	Woodward, Miss Mary Blackburne
Van Sinderen, Adrian	York, Rt. Rev. Mgr. John C.

SUSTAINING MEMBERS ¹*By payment of \$25 annually*

Adams, Charles S. (M)	Hammitt, Walter (E)
Anderson, John (G)	*Hart, Miss Adelaide (M)
Bishop McDonnell Memorial High School (E)	Hart, Miss Lauribel (E)
Blum, Robert E. (E)	Hincken, Miss Elsie O. (G)
Boetticher, Miss E. C. (G)	Hollwegs, Miss Anna (G)
Bromley, Mrs. Bruce (E)	Hyatt, Miss Annie (E)
Bryant, Miss Helen W. (G)	Ingraham, Edward A. (G)
Christy, Francis T. (E)	Ingraham, Henry A. (E)
Conroy, Gardiner (E)	Ingraham, Mrs. Henry C. M. (G)
Cruikshank, Mrs. Russell V. (E)	Jenkins, Mrs. John Sloane (M)
Davidson, Sidney W. (E)	King, Mrs. Warner (M)
Dillon, Miss Mary E. (E)	Kirkman, Mrs. A. S. (M)
Doolittle, Mrs. R. Edson (E)	Knox, Mrs. David D. (G)
Doscher, Mrs. A. B. (M)	*Lambert, Frank (M)
Edwards, Mrs. Wm. Seymour (M)	Langdon, Mrs. Palmer H. (G)
Faber, Lothar W. (M)	Lanman, David H. (E)
Felter, Mrs. Mary Bentley (E)	Latimer, Miss Mary (G)
Fernstrom, Miss Thora M. (E)	Leech, Mrs. John E. (G)
Field, Mrs. W. D. C. (M)	Logan, Miss Anna A. (E)
Forward, DeWitt A. (E)	Loomis, Guy (M)
Froeb, Charles (M)	Lorence, Louis (E)
Garvin, Mrs. Edwin L. (E)	Maynard, Dr. Edwin P., Jr. (E)
Goddard, Mrs. A. E. (M)	Mead, D. Irving (M)
Graves, Dr. Arthur H. (E)	Merkert, Miss Marie M. (M)
Halstead, Mrs. J. Morton (M)	Morton, Dr. L. J. (M)
	Pasternack, Mrs. Richard (M)

¹ (G), Through the Botanic Garden; (M), Museum; (E), Educational Department.

Perkins, Mrs. Charles E. (E)
 Petrocelli, Mrs. J. (E)
 Price, Mrs. William H. (M)
 Reimer, Miss Margareth B. (M)
 Righter, Miss Jessie H. (M)
 Rogers, Mrs. Charles E., Jr. (E)
 Rossin, Alfred S. (M)
 Sartori, Joseph J. (G)
 See, Alonzo B. (G)
 Simmons, Mrs. Frank E. (G)
 Smith, Dr. Bernard H. (E)

Southard, Miss Edith Brett (M)
 Uhrbrock, Mrs. E. F. (G)
 Underwood, Mrs. John T. (M)
 Van Vleck, Miss Jane (M)
 Walmsley, Mrs. Clara E. (E)
 Weber, F. C. (E)
 Weeth, Dr. Charles R. (E)
 White, Mrs. Grace (E)
 Whitney, Mrs. H. F. (E)
 Wood, Miss Emily S. (E)
 Zoebisch, Mrs. C. T. (M)

BROOKLYN BOTANIC GARDEN ANNUAL MEMBERS

By payment of \$10 annually

Affeld, F. O.
 Allen, Mrs. Joseph Dana
 Andrews, Miss Grace
 Arai, Mrs. Yoneo
 Arata, Mrs. Florence B.
 Babbott, Mrs. Frank L.
 Bacon, Mrs. Robert
 Baden, Victor
 Barbanell, Miss Charlotte
 Barbarin, Mrs. Gabrielle
 Barber, Mrs. Robert F.
 Bassett, Mrs. Hubert M.
 Bay Ridge Garden Club
 Beck, Mrs. Anna W.
 Becker, Frederick W.
 Becker, Miss Johanna L.
 Beckerman, Bernard
 Behr, Edward A.
 Behr, Miss Maria O.
 Benson, Mrs. Philip A.
 Berg, Mrs. J. Frederic
 Berlind, Mrs. Ruth F.
 Berman, Mrs. Judith H.
 Betts, Miss Dorothy L.
 Bildersee, Miss Adele
 Biren, Mrs. Frances A.
 Bittner, Mrs. L.
 Blackman, Dr. William W.
 Blatchford, Miss Edna Léonie
 Blatchford, Miss Stella

Blum, Mrs. Edward Charles
 Boardman, Mrs. George M.
 Boehrer, Mrs. Charles A.
 Bornmann, Dr. Alfred
 Bourke, Miss Collette
 Bowne, Mrs. Frederic
 Braman, Miss Irene M.
 Branagan, Miss Elizabeth A.
 Brandt, Mrs. Laura L.
 Brewster, Mrs. Walter Shaw
 Brierley, John R.
 Brinsmade, Miss Alice
 Brockaway, Mrs. Otilia A.
 Brody, Mrs. Rose Ella
 Brooklyn Plant, Flower and Fruit
 Guild
 Brossard, Miss Theodora
 Browder, Dr. Jefferson
 Brower, Frank Daniel
 Brower, Mrs. George E.
 Brown, Mrs. G. Stewart
 Brown, Roscoe C. E.
 Brown, Mrs. Samuel A.
 Brown, Mrs. Samuel T.
 Brown, Mrs. Theodore Burgess
 Browning, Dr. William
 Brukenfeld, Morris
 Brunjes, William G.
 Bush, Mrs. Robert W.
 Butterick, Miss Mary E.

- Cabot, Dr. Irving L.
 Cadbury, Mrs. Olive C.
 Cadman, Mrs. Frederick L.
 Camp, Miss Caroline D.
 Campbell, Miss Mary
 Canis, Prof. Otto P. M.
 Carpenter, Mrs. James N.
 Carter, Mrs. Oliver Goldsmith
 Cary, Mrs. William H.
 Casamajor, Miss Martha
 Casper, Sidney J.
 Cass, Miss Erna W.
 Cedarhurst Garden Study Group
 Chapman, Mrs. A. Wright
 Christy, Mrs. Francis T.
 City Gardens Club
 Clark, Mrs. John B.
 Clark, Dr. Raymond
 Coffin, Mrs. I. Sherwood
 Conkling, Miss Louella B.
 Conover, Mrs. Henry S.
 Contemporary Club, The
 Corcoran, Mrs. James J.
 Cornman, Mrs. Tessie
 Coutts, Miss Frances H.
 Coykendall, Mrs. W. E.
 Crane, Mrs. Claude G.
 Cranford, Frederick L.
 Cranford, Miss Margaret
 Cranford, Mrs. Walter V.
 Crary, Mrs. Miner D.
 Creamer, William
 Cruikshank, Russell V.
 Crystal, Mrs. Beatrice
 Cummings, Mrs. Tom
 Currie, Mrs. James N.
 Dana, Mrs. Arnold Guyot
 Dana, Mrs. Arthur D.
 Dann, James E.
 Dauernheim, A. M.
 Davenport, Mrs. Henry J.
 Davidson, Mrs. John A.
 Decker, Mrs. Charles A.
 deComps, Miss Pauline L.
 Delafield, Mrs. John R.
 Denbigh, Miss Helen D.
 Devin, Miss M. Catherine
 De Voe, Franklin M.
 Dickey, Miss Annie Louise
 Dienst, Mrs. F. M.
 Dillon, Miss Mary E.
 Dinsmore, Mrs. Laird C.
 Di Paola, Miss Rose M.
 Ditmas, Miss Caroline
 Dlugatz, Dr. Herman G.
 Dobbie, Mrs. Horace B.
 Dodge, Mrs. Francis D.
 Doherty, Mrs. Philip A.
 Doman, Mrs. Samuel H.
 Donovan, Miss Loretto V.
 Dreier, Mrs. H. Edward
 Duhme, Mrs. H. F.
 *du Pont, Mrs. T. Coleman
 DuVal, Guy
 DuVal, Mrs. Guy
 Earle, Mrs. Wm. P., Jr.
 Eckardt, Mrs. Remick C.
 Eckstein, Harry
 Edinburg, Mrs. William G.
 Eidlitz, Mrs. Ernest Frederick
 Eilers, Miss Emma
 Elbert, Mrs. William
 Eldredge, Mrs. O. Stanley
 Elkus, Mrs. Abram I.
 Emerson, Mrs. William
 Ericsson, Miss H. Wilhelmina
 Etzel, Mrs. Mary M.
 Everit, Mrs. Edward A.
 Fairbanks, Miss Maria B.
 Fairchild, B. T.
 *Fairchild, Mrs. F. K.
 Fardelman, Mrs. A. Von Prief
 Far Rockaway Women's Club:
 Garden Group
 Fawcett, Mrs. Alfred
 Fawcett, Mrs. James M.
 Fawcett, Judge Lewis L.
 Fink, Mrs. Ella
 Fisher, Miss Edna M.
 Fiske, Mrs. E. Rodney
 Fitzhugh, Mrs. William W., Jr.
 Fitz Patrick, Mrs. M. J.

- Flushing Garden Club, Inc.
 Foote, Mrs. Merrill N.
 Ford, Mrs. Sumner
 Fortnightly Library Club
 Foster, Miss A. M.
 Fox, Mrs. Mortimer J.
 Friedman, Mrs. Morris
 Frohne, Mrs. Theodore
 Fuchs, Mrs. Helen H.
 Gaillard, Mrs. William Dawson
 Gallup, Miss Anna B.
 Garden Club of Madison
 Gibson, Miss Gertrude L.
 Gillingham, Mrs. Catherine R.
 Gillingham, James L.
 Girls Commercial H. S., Brooklyn
 Girls Commercial H. S., Brooklyn
 Girls Commercial H. S., Brooklyn
 Girls Commercial H. S., Brooklyn
 Girls Commercial H. S., Brooklyn
 Gladding, Walter M.
 Gloster, Cecil
 Gluckman, Michael
 Goetze, Miss Emily H.
 Goetze, Mrs. Otto
 Goldfarb, Mrs. Bernard M.
 Goldstein, Louis G.
 Gonnoud, A. J.
 Goodfellow, Mrs. M. P.
 Gordon, Dr. Onslow A., Jr.
 Great Neck Garden Club
 Green, Dr. Wyman R.
 Greene, Mrs. Everett
 Grieff, Victor
 Griffen, Mrs. Charles
 Griffiths, Mrs. Eben
 Gustafson, Miss Anna M.
 Haas, Miss Edith
 Haff, Mrs. Alvah C.
 Hagstrom, Mrs. Henry Theodore
 Hale, Miss Alfaretta May
 Halstead, Mrs. J. Morton
 Halstead, Mrs. Kenneth B.
 Halsted, Mrs. Henry M.
 Hamburger, Mrs. Jerome W.
 Hamilton, Mrs. George S.
 Hanks, Miss Lenda T.
 Hargitt, Dr. Chas. A.
 Harris, Mrs. Augustus
 Harris, Mrs. Earl B.
 Harrisson, Mrs. Stephen M.
 Haussler, Miss Dorothy
 Hawes, Dr. Edward S.
 Haynes, Mrs. Edward
 Haynes, Miss Mabel
 Healy, D. J.
 Hearn, Mrs. Frank T.
 Hecht, Miss Sadie
 Heissenbuttel, Mrs. Henry C.
 Heissenbuttel, Mrs. Wm. F.
 Held, Mrs. Samuel E.
 Heller, Dr. Jacob
 Helm, Mrs. Gustave A.
 Henning, Mrs. George
 Hershcovitz, Eli
 Hervey, Leon
 Hester, Mrs. W. V., Jr.
 Hevle, Miss Frances M.
 Higgins, Dr. Alice K.
 Hill, Mrs. Robert C.
 Hills, Mrs. James M.
 Hirschhorn, Herman
 Hoag, Mrs. J. Edward
 Hobart, Alexander C.
 Hoffmann, Mrs. George J.
 Holcombe, Mrs. Walter P.
 Hollander, Mrs. Lewis E.
 Hollenback, Miss Amelia B.
 Hollwegs, Miss Katherine
 Holme, A. L.
 Hoppin, Miss Laurette A.
 Horstein, Miss Mina
 Howard, Miss Katherine C.
 Howard, Miss Laurette
 Hume, Mrs. Henry M.
 Hume, Mrs. Russell S.
 Humpstone, Mrs. O. Paul
 Huncke, Mrs. Helen F.
 Hutton, Miss Sarah E.
 Iffla, Miss Florence E.
 Ingersoll, Mrs. Raymond V.
 Ingraham, Miss Grace
 Ingraham, Dr. Ruth
 Irish, William S.

- Jackson, Mrs. Edward
 Jackson, Mrs. Samuel, Sr.
 Jacobs, Harry
 Jadwin, Mrs. Palmer H.
 Jadwin, Mrs. Stanley P.
 James, Mrs. John Wells
 James, Mrs. Warner
 James, William L.
 James Madison High School, Bi-
 ology Dept.
 Jameson, Dr. P. Chalmers
 Jameson, Mrs. P. Chalmers
 Jansen, Miss Dora
 Jennings, Miss Annie B.
 Jewell, John V.
 Johanns, Mrs. Frederick L.
 Johnson, Mrs. David C.
 Johnston, Mrs. F. Cliffe
 Johnston, Miss Florence
 Jones, Mrs. Dunham C.
 Jones, Miss Helen Swift
 Jones, Mrs. Jane Bates
 Jones, Mrs. Wallace T., Jr.
 Jones, Mrs. Wallace Thaxter
 Jourdan, James H.
 Judd, Mrs. Orrin R.
 Kahrs, William C.
 Kay, Miss Lillian S.
 Keating, Miss Margaret R.
 Kelley, Mrs. Herman A.
 Kent, Mrs. Edward H.
 Kerr, Mrs. William F.
 Ketcham, Miss Clara L.
 Kindergarten Mother's Club, P. S.
 241
 Kirk's School, Miss
 Klempler, Mrs. Ida
 Knigin, Miss Sylvia
 Knox, Miss Maria
 Kunz, Mrs. M. R.
 Lafrentz, Miss Olga L.
 Lancaster, Miss Bertha
 Landon, Mrs. Stephen
 Lane, Miss Ella M.
 Lantry, Mrs. Joseph P.
 Lathrop, Mrs. John H.
 Laura S. Stewart Garden Club
 Lawrence, Mrs. Herbert
 Lawrence School, The
 Lee, Mrs. Robert C.
 *Leininger, Mrs. Ralph
 Lester, Mrs. Maxwell
 Levine, Mrs. Sarah
 Levingson, Isaac
 Levy, Mrs. Eleanor R.
 Levy, Harry
 Lewis, Clarence McK.
 Lewis, Mrs. Florence
 Lincoln, Mrs. Roy M.
 Litchfield, Miss Cornelia
 Lockwood, Mrs. William A.
 *Lohman, Miss Helen
 Lohman, Mrs. W. H.
 Loines, Miss Elma
 Loines, Mrs. Stephen
 Long, Mrs. Claramae B.
 Lott, Mrs. Henry DeWitt
 Love, John H.
 Lupka, Mrs. Lillian A.
 Lysaght, Miss Agnes
 MacCauley, Miss Minnie
 Mackey, Mrs. J. T.
 Mackey, Miss Mary R.
 Maguer, Mrs. Thomas F.
 Manville, Mrs. H. Edward
 Marks, Mrs. Alexander D.
 Marrow, Miss Lucille
 Marshall, Mrs. William W.
 Maynard, Mrs. Edwin P.
 Maynard, Mrs. Edwin P., Jr.
 McCarthy, Edward Joseph
 McCarthy, Miss Mildred H.
 McCormick, Mrs. E.
 McDermott, Mrs. Arthur V.
 McGill, Mrs. Franklin C.
 McGill, Mrs. Margaret
 McHugh, Mrs. John J.
 McLaren, James R.
 McLean, Mrs. F. B.
 Meeker, Samuel M.
 Mehl, Mrs. Frances
 Mehl, Joseph

- Mehr, Stanley
 Meissner, Mrs. William C.
 Mellen, Mrs. Graham K.
 Merrill, Mrs. Whitney W.
 Merritt, Miss Lilla H.
 Meserole, Mrs. Walter M.
 Meyenborg, Miss Evelyn A.
 Michelsen, Mrs. Letitia M.
 Miller, Mrs. Joseph B.
 Miller, Miss Lizzie K.
 Moore, Miss Jane L.
 Morgan, Miss Charlotte E.
 Morse, Mrs. George Perley
 Mudge, Mrs. Alfred E.
 Müller, Adolf
 Mullikin, Mrs. Richard
 Myerson, Mrs. M. C.
 Namm, Major Benjamin H.
 Napoli, Peter
 Natelson, Mrs. L. F.
 Nathan, Mrs. Hortense L.
 Needham, Henry C.
 Nellis, Dr. Frank G.
 Neumann, Mrs. Tamar M.
 *Newman, Miss Louise M.
 Newton, Mrs. Charles E., Jr.
 North, Mrs. John H.
 Noschkos, Monroe
 Oak, Miss Dorothy
 O'Brien, Mrs. A. J.
 O'Donohue, Mrs. Charles A.
 Ohly, Dr. John H.
 Ormsbee, Mrs. Malcolm H.
 Osborne, Mrs. Dean C.
 Otis, Mrs. Charles H.
 Packard, Miss Elizabeth H.
 Packer, Mrs. A. O.
 Paepcke, Mrs. E. R.
 Paffard, Mrs. Frederic C.
 Palmer, Miss Emma J.
 Parent Teachers' Association, P. S.
 241
 Parker, Mrs. Elizabeth B.
 Parshelsky, Moses L.
 Parsons, Frank H.
 Pashley, Mrs. Charles L.
 Patterson, Dr. William M.
 Peck, Mrs. Bayard L.
 Peck, Fremont C.
 Peloubet, Mrs. S. W.
 Penny, Mrs. J. H.
 Perkins, Mrs. Charles E.
 Perry, Mrs. John M.
 Peshkin, Jacob
 Peters, Mrs. Wm. Sterling
 Pfeiffer, Miss C. A.
 Phenix, Mrs. Spencer
 Pierrepont, Miss Anna J.
 Pilsbury, Mrs. E. H.
 Platt, Miss E. L.
 Platt, Rutherford
 Plumb, Mrs. E. T.
 Plump, Miss Julia H.
 Pond, Miss Pearl F.
 Pond, William H.
 Popper, Mrs. William C.
 Porter, Mrs. E. Pender
 Post, Mrs. James H.
 Post, Miss Jessie W.
 Potter, Mrs. R. Burnside
 Powers, Miss Z. A.
 Pratt, Abram J.
 Pratt, Frederic B.
 Pratt, Harold I.
 Pratt, Mrs. Katherine Sloan
 Pratt, Miss Mary
 Pratt, Mrs. Richardson
 Price, Frank J.
 Prince, Mrs. Benjamin
 Provost, Miss Eva M.
 Public School 197, Brooklyn
 Public School 241, Brooklyn
 Purdy, Miss Maud H.
 Queensboro Garden Club
 Queens Village Garden Club
 Raiman, Mrs. Robert I.
 Rathbun, Mrs. Nathaniel P.
 Ray, Miss Mabel
 Recknagel, Miss Alice
 Reed, Mrs. George M.
 Reinhardt, Mrs. Charles
 Richardson, William C.

Rinschede, Miss Ida E.
 Roberts, Mrs. John S.
 Roberts, Miss Willa
 Roe, Mrs. Clinton T.
 Rosati, Dr. Vincent F.
 Rowe, Mrs. Frederick W.
 Ruckgaber, Mrs. Louis A.
 Sanders, Edward I.
 Satterlee, Mrs. Herbert L.
 Scheepers, John T.
 Schellhammer, Fred M.
 Schepmocs, Mrs. F. R.
 Schiller, Miss Frances
 Schneider, David
 Schoonhoven, Mrs. John J.
 Schrader, Miss M. H.
 Schulz, Mrs. Josephine Anna
 Schwarz, Mrs. Henry F.
 Scoville, Mrs. Herbert
 Seibert, Mrs. Albert E.
 Seidt, Miss Olive
 Seldin, Mrs. Tena
 Sellew, Mrs. Waldo W.
 Sessler, David
 Shanahan, Mrs. Thomas E. J.
 Shaw, Miss Agnes M.
 Shaw, Mrs. Awbrey N.
 Shaw, Isidor
 Shepard, Charles S.
 Sherman, Mrs. Arnold W.
 Sherman, Mrs. S.
 Shevell, Mrs. Catherine
 Siebert, Mrs. William
 Simpson, Miss Etta
 Simpson, Mrs. T. A.
 Slow, Frank
 Smith, B. Herbert
 Smith, Miss Bertha H.
 Smith, Mrs. C. M.
 Smith, George W.
 Smith, Miss Leona A.
 Smith, Mrs. Norman
 Smith, Mrs. Townsend J.
 Snedeker, Mrs. Edwin L.
 Sormani, Miss Julia A.
 Spingarn, J. E.

Spingarn, Mrs. J. E.
 Sprackling, Mrs. Nelson
 Spring, Miss M. Louise
 Staber, Miss Maud J.
 Starkweather, Mrs. A. K.
 Steele, Roswell H.
 Steinberg, Morris
 Stellwagen, Fred L.
 Sternberg, Martin N.
 Stewart, Miss E. Grace
 Stewart, Mrs. Seth Thayer
 Stires, Mrs. Ernest M.
 Stone, Mrs. Charles L.
 Stout, Mrs. Charles H.
 Strahs, Miss Jeanette
 Straus, Hugh Grant
 Streeter, Mrs. Milford B.
 Strong, Mrs. Theron G.
 Struse, Mrs. John F.
 Stuart, Lyall L.
 Sullivan, Miss Bessie
 Sweedler, Nathan
 Taber, Mrs. D. Shearman
 Taylor, Mrs. Jeannette
 Thacher, Mrs. A. B.
 Thatcher, Mrs. Edwin H.
 Thatcher, Mrs. John H.
 Thiemer, Mrs. E. J. H.
 Thirkield, Mrs. Gilbert H.
 Three Village Garden Club
 Tiernan, Mrs. Bartholomew T.
 Tilley, Dr. R. McFarlane
 Tompkins, Miss Elizabeth M.
 Tousey, Miss Elizabeth
 Towbin, Miss Julia
 Towl, Mrs. F. M.
 Treadwell, Mrs. Grace Trufant
 Troeck, Miss M. Dorothy
 Trull, Mrs. Frank T.
 Turner, Mrs. Henry C.
 *Tusch, Mrs. Walter
 Tuttle, Mrs. Winthrop M.
 Vail, Harry C.
 Valentine, Stephen
 Van Brunt, Miss Elizabeth R.
 Van Brunt, Jeremiah R.

Van Sinderen, Adrian	Willard, George N.
Van Sinderen, Mrs. Adrian	Williams, Mrs. John O.
Van Sinderen, Henry B.	Williams, Mrs. William E.
Von Lehn, Mrs. Richard	Williamson, Miss Marguerite Moli- ère
Walcott, Mrs. Arthur S.	Wills, Louis Charles
Wallace, Mrs. Charles F.	Wilson, Mrs. Francis A.
Walton, Mrs. Henry A.	Wood, Miss Helen C.
Ward, Mrs. Charles L.	Wood, Mrs. Willis D.
Wark, Charles F.	Woodmere Garden Club
Warren, William H.	Woodsburgh Garden Club
Warshaw, Mrs. Rose	Woodward, Miss Mary Blackburne
Wason, Wm. J., Jr.	Woolley, George I.
Wayman, Robert	Wrenn, Mrs. Allen Stewart
Weeth, Dr. Charles R.	Yale, Mrs. William T.
Weinberg, Harry	Young, Miss Abigail
Wells, Mrs. Walter F.	Zabriskie, Mrs. Elmer T.
Wheeler, Mrs. William G.	Zadde, Mrs. Augusta
White, Alain	Zellner, Mrs. Carl P.
White, Mrs. Alexander M.	Zimmele, Charles F.
Willard, Miss Dorothy	
	Zimmerman, Mrs. P. K.

SUMMARY OF MEMBERSHIP

Benefactors	8	
Patrons	13	
Donors	28	
Permanent Members	72	
Life Members		
Through the Botanic Garden	17	
Through Other Departments	207	224
	—	
Sustaining Members		
Through the Botanic Garden	15	
Through Other Departments	58	73
	—	
Annual Members	557	
	—	
Total, as of April 2, 1938		975

The Brooklyn Institute of Arts and Sciences

OFFICERS OF THE BOARD OF TRUSTEES

PRESIDENT

EDWARD C. BLUM

FIRST VICE-PRESIDENT

WALTER H. CRITTENDEN

SECOND VICE-PRESIDENT

ADRIAN VAN SINDEREN

THIRD VICE-PRESIDENT

SUMNER FORD

TREASURER

EDWIN P. MAYNARD

SECRETARY

JOHN H. DENBIGH

BOTANIC GARDEN GOVERNING COMMITTEE

MISS HILDA LOINES, *Chairman*

PHILIP A. BENSON

WALTER HAMMITT

EDWARD C. BLUM, *Ex officio*

WILLIAM T. HUNTER

MRS. WILLIAM H. CARY

DAVID H. LANMAN

WALTER H. CRITTENDEN

EDWIN P. MAYNARD

MRS. LEWIS W. FRANCIS

ALFRED E. MUDGE

EX OFFICIO MEMBERS OF THE BOARD

THE FOLLOWING OFFICIALS OF THE CITY OF NEW YORK

THE MAYOR

THE COMPTROLLER

THE COMMISSIONER OF PARKS

GENERAL INFORMATION

MEMBERSHIP.—All persons who are interested in the objects and maintenance of the Brooklyn Botanic Garden are eligible to membership. Members enjoy special privileges. Annual Membership, \$10 yearly; Sustaining Membership, \$25 yearly; Life Membership, \$500. Full information concerning membership may be had by addressing *The Director, Brooklyn Botanic Garden, 1000 Washington Avenue, Brooklyn, N. Y.* Telephone, Prospect 9-6173.

THE BOTANIC GARDEN is open free to the public daily from 8 a.m. until dusk; on Sundays and Holidays it is open at 10 a.m.

ENTRANCES.—On Flatbush Avenue, near Empire Boulevard and near Mt. Prospect Reservoir; on Washington Avenue, south of Eastern Parkway and near Empire Boulevard; on Eastern Parkway, west of the Museum Building.

The street entrance to the Laboratory Building is at 1000 Washington Avenue, opposite Crown Street.

To ASSIST MEMBERS and others in studying the collections the services of a docent may be obtained. This service is free of charge to *members of the Botanic Garden*; to others there is a charge of 50 cents per person. Arrangements must be made by application to the Curator of Public Instruction at least one day in advance. No parties of less than six adults will be conducted.

To REACH THE GARDEN take Broadway (B.M.T.) Subway to Prospect Park Station; Interborough Subway to Eastern Parkway-Brooklyn Museum Station; Flatbush Avenue trolley to Empire Boulevard; Franklin Avenue, Lorimer Street, or Tompkins Avenue trolley to Washington Avenue; St. John's Place trolley to Sterling Place and Washington Avenue; Union Street or Vanderbilt Avenue trolley to Prospect Park Plaza and Union Street. BY AUTOMOBILE from points on Long Island take Eastern Parkway west and turn left at Washington Avenue; from Manhattan, take Manhattan Bridge, follow Flatbush Avenue Extension and Flatbush Avenue to Eastern Parkway, turn left following Parkway to Washington Avenue; then turn right.

BROOKLYN BOTANIC GARDEN PUBLICATIONS

RECORD. Established, January, 1912. An administrative periodical issued quarterly (1912-1928); bimonthly (1929-1932); quarterly (1933-). Contains, among other things, the *Annual Report* of the director and heads of departments, special reports, announcements of courses of instruction, seed list, guides, miscellaneous papers, and notes concerning Garden progress and events. Free to members of the Garden. To others \$1.00 a year. Circulates in 59 countries.

MEMOIRS. Established, July, 1918. Published irregularly. Circulates in 47 countries.

Volume I. *Dedication Papers*: comprising 33 scientific papers presented at the dedication of the laboratory building and plant houses, April 19-21, 1917. 521 pages. Price \$3.50, plus postage.

Volume II. The vegetation of Long Island. Part I, The vegetation of Montauk: A study of grassland and forest. By Norman Taylor, June 11, 1923. 108 pages. Price \$1.00, plus postage.

Volume III. Vegetation of Mount Desert Island, Maine, and its environment. By Barrington Moore and Norman Taylor, June 10, 1927. 151 pages. Price \$1.60.

CONTRIBUTIONS. Established, April 1, 1911. Papers originally published in periodicals, reissued as "separates" without change of paging, and numbered consecutively. Twenty-five numbers constitute one volume. Price 25 cents each, \$5.00 a volume. Circulates in 34 countries.

No. 76. *Inheritance of resistance to the loose and covered kernel smuts of Sorghum: II. Feterita hybrids*. 22 pages. 1937.

No. 77. *Monographic studies in the Genus Eleocharis. IV*. 63 pages. 1937.

No. 78. *Experiments on latent infection of resistant varieties by the loose and covered smut of oats*. 11 pages. 1937.

No. 79. *The iris thrips and its control by hot water, with notes on other treatments*. 12 pages. 1937.

No. 81. *Inheritance of resistance to loose and covered smuts in oat hybrids*. 10 pages. 1937.

LEAFLETS. Established, April 10, 1913. Published weekly or biweekly during April, May, June, September, and October. The purpose of the *Leaflets* is primarily to give announcements concerning flowering and other plant activities to be seen in the Garden near the date of issue, and to give popular, elementary information about plant life for teachers and others. Free to members of the Garden. To others, fifty cents a series. Single numbers 5 cents each. Circulates in 28 countries. Temporarily discontinued, 1936-37.

GUIDES to the collections, buildings, and grounds. Price based upon cost of publication. Issued as numbers of the RECORD; see above.

Guide No. 5. *The Rock Garden*. 28 illustrations. Price, 35 cents. By mail, 40 cents.

Guide No. 6. *Japanese potted trees (Hachinoki)*. 11 illustrations. Price, 35 cents. By mail, 40 cents.

Guide No. 7. *The story of our boulders: Glacial geology of the Brooklyn Botanic Garden*. 22 illustrations. Price, 35 cents. By mail, 40 cents.

Guide No. 8. *The story of fossil plants*. 8 illustrations. Price, 35 cents. By mail, 40 cents.

SEED LIST. (*Delectus Seminum*) Established, December, 1914. Since 1925 issued each year in the January number of the RECORD. Circulation includes 160 botanic gardens and institutions located in 40 countries.

ECOLOGY. Established, January, 1920. Published quarterly in coöperation with the ECOLOGICAL SOCIETY OF AMERICA. Subscription, \$4.00 a year. Circulates in 48 countries.

GENETICS. Established, January, 1916. Bimonthly. Subscription, \$6.00 a year. Circulates in 37 countries.

BROOKLYN BOTANIC GARDEN RECORD

Vol. XXVII

JULY, 1938

No. 3

CONTENTS

BOTANIC GARDENS OF THE WORLD MATERIALS FOR A HISTORY

SECOND EDITION

The Price of this Issue is \$2.50

PUBLISHED QUARTERLY
AT PRINCE AND LEMON STREETS, LANCASTER, PA.
BY THE BROOKLYN INSTITUTE OF ARTS AND SCIENCES
BROOKLYN, N. Y.

Entered as second-class matter in the post-office at Lancaster, Pa., under act of August 24, 1912.

BROOKLYN BOTANIC GARDEN

Scientific, Educational, and Administrative Officers

SCIENTIFIC AND EDUCATIONAL

The Staff

C. STUART GAGER, Ph.D., Sc.D., Pd.D., *Director*
MONTAGUE FREE, Certificate, Royal Botanic Gardens, Kew, *Horticulturist*
ARTHUR HARMOUNT GRAVES, Ph.D., *Curator of Public Instruction*
ALFRED GUNDERSEN, Docteur de l'Université (Paris), *Curator of Plants*
WILLIAM E. JORDAN, B.S., *Librarian*
GEORGE M. REED, Ph.D., *Curator of Plant Pathology*
ELLEN EDDY SHAW, B.S., *Curator of Elementary Instruction*
HENRY K. SVENSON, Ph.D., *Curator of the Herbarium*
MARGARET M. DORWARD, A.B., *Assistant Curator of
Elementary Instruction*

Other Officers

MARY AVERILL, *Honorary Curator of Japanese Gardening and Floral Art*
HAROLD A. CAPARN, *Consulting Landscape Architect*

RALPH CURTISS BENEDICT, Ph.D., *Resident Investigator (Ferns)*
RALPH H. CHENEY, Sc.D., *Resident Investigator (Economic Plants)*

EMILIE PERPALL CHICHESTER, *Library Assistant*
CHARLES F. DONEY, M.S., *Assistant in Woody Plants*
WILLIAM H. DURKIN, *Curatorial Assistant*
ELSIE TWEMLOW HAMMOND, M.A., *Instructor*
D. ELIZABETH MARCY, A.M., Ph.D., *Research Assistant*
FRANCES M. MINER,* A.B., *Instructor*
MARGARET BURDICK PUTZ, *Curatorial Assistant*
HESTER M. RUSK, A.M., *Instructor*
MARGERY H. UDELL, *Curatorial Assistant*
L. GORDON UTTER, M.S., Ph.D., *Research Assistant*
HILDA VILKOMERSON, A.M., *Curatorial Assistant*

LOUIS BUHLE, *Photographer*
MAUD H. PURDY, *Artist*

ADMINISTRATIVE

DANIEL C. DOWNS, *Secretary and Accountant*
MAUDE E. VORIS, *Assistant Secretary*
NORMA STOFFEL BANTA, *Office Assistant*

MARIE-LOUISE HUBBARD, A.M., *Secretary to the Director*
GERTRUDE W. MERRILL,† A.B., *Field Secretary*
FRANK STOLL, *Registrar and Custodian*

HELEN E. BENNETT, *Stenographer*
LAURA M. BREWSTER, *Stenographer*
CONSTANCE PURVES ELSON, B.A., *Stenographer*

* On leave of absence, October 1, 1937, to October 1, 1938.

† Until July 31, 1938.

BROOKLYN BOTANIC GARDEN RECORD

VOL. XXVII

JULY, 1938

NO. 3

BOTANIC GARDENS OF THE WORLD MATERIALS FOR A HISTORY

PREFACE TO FIRST EDITION

Several years ago the writer began to collect data concerning the history, organization, and work of the botanic gardens of the world. A blank questionnaire was sent to all gardens of record. Some of these were returned with full answers to all the questions, others were given only meagre replies, and still others were never returned. This accounts in large part for the fact that the data are much fuller for some gardens than for others. Pressure of administrative duties makes it increasingly unlikely that time can be found in the very near future to make the record fuller and more accurate, and so it is offered as it is because of knowledge of increasing need of such data in the botanical world.

Botanic gardens fall roughly in one of two categories—those that are themselves institutions, and those that are only planted areas, literally “gardens,” serving as adjuncts to university departments of botany or other institutions. Both kinds are here included, but the following types of living plant collections, even though some of them may be loosely designated as “botanic gardens,” are not included: Nature preserves or “Wild flower sanctuaries,” Memorial groves, Public parks where the trees are labelled, Flower gardens in public parks, Private collections of trees and shrubs (with a few exceptions where these collections are open to the public). For the most part this is a list of institutions, or of gardens organized primarily for botanical research or instruction or both.

The choice of “botanic” vs. “botanical” appears to be purely arbitrary, with no distinction in meaning. The use of the plural,

“gardens,” vs. “garden,” is also arbitrary, but there appears to be a strong tendency on the part of the public to use the plural, especially for public institutions. This convention is a very old one extending back at least as far as the time of ancient Greece. Thus we read of the “gardens of Epicurus” (κῆποι Ἐπικούρου) which was really only one “garden.”

The early dates of establishment of some of these institutions, still flourishing, emphasize a point the writer has made elsewhere, namely, the great momentum of botanic gardens—their tendency to persist through financial and other discouragements, political and social upheavals, and changes in the place of emphasis in botanical science. This shows that botanic gardens minister to fundamental human needs—scientific, educational, recreational, civic, and economic.

Acknowledgment should here be made of the invaluable bibliographical assistance rendered by the librarian, Mr. William E. Jordan, and staff of the Brooklyn Botanic Garden Library, and the able cooperation, especially outside of official hours, by Miss Marie Louise Hubbard, my secretary. Without these aids this report would have been much more meager and longer delayed. Grateful acknowledgment is also made of the cooperation of those who took the time to fill out and return the questionnaires and otherwise to supply information.

The writer makes no pretense that he has succeeded in making a complete list of botanic gardens, even within the limitations of the definition above implied. Nor could anyone who has compiled masses of data ever claim with confidence that there are no important omissions or inaccuracies.

It is hoped that this record may some day be of use to someone who will attempt the important and worth-while task of writing a real history of the botanic gardens of the world.

C. STUART GAGER.

PREFACE TO SECOND EDITION

The necessity for a second edition has afforded an opportunity to add a few gardens, new since the publication of the first edition, and older gardens not formerly included; also to give further information (not made available for the first edition) concerning

many gardens, and to correct errors. Numerous gardens that replied not at all or only meagerly or carelessly to our first questionnaire have supplied fuller and more carefully prepared information for the second edition. Undoubtedly there are still omissions—many gardens have made no reply to questionnaires and letters—and in all likelihood there are errors. It may be stated that all data follow faithfully the information as supplied by the gardens themselves, and have been carefully checked against the questionnaires returned. One despairs, however, of attaining accuracy when, for example, dates supplied by the person concerned are not the same as the corresponding dates supplied by the same person in *American Men of Science*. That has been the case in more than one instance.

In general, botanical “institutes” and institutions for botanical research are not listed unless they include a botanic garden. In reply to two or three letters received concerning the first edition, it may be emphasized that this work is not intended merely as a guide to existing botanic gardens, as they now are, but as materials for a *history* of botanic gardens, existing or no longer existing, and thus as a contribution to one of the most important phases of the history of the organization and administration of botanical science, from the time of Aristotle to the present.

A request for information, with questionnaire blank, has been sent (in most cases more than once) to every existing garden listed in the following pages. Meagerness of information means either that no more was supplied by the institution or that no reply was received.

In such matters as official names of institutions, mail addresses, spelling of place names, etc., the author has adhered strictly to the data *as supplied by the institutions*, without attempting to edit for uniformity. Quotations not otherwise credited are from returned questionnaires.

The original data received from the various gardens are on file for reference in the Library of the Brooklyn Botanic Garden.

The author will, as before, be glad to be advised of any errors or omissions noted by those consulting the work. He is also happy to acknowledge the continued cooperation of Miss Marie Louise Hubbard, who did all the work in preparation of the final manu-

script, and read all the proof; and Mr. William E. Jordan, librarian of the Brooklyn Botanic Garden, and his staff, who have rendered invaluable bibliographical service. He is under much obligation to Dr. Leon Croizat, who offered to read the galley and page proof. Grateful acknowledgment is made for the careful and helpful information supplied by several directors of gardens, and for letters from users of the first edition for pointing out inaccuracies and making other helpful suggestions. Apparently this work has been eagerly welcomed in many countries and has "filled a long-felt want."

C. STUART GAGER.

Anglo Egyptian Soudan

KHARTOUM

GOVERNMENT GARDENS

"1. There are no gardens in the Anglo Egyptian Sudan which might rightly be termed botanic gardens. The gardens organisation of which I am in charge at Khartoum consists of The Palace Gardens, Public Gardens and street trees, Government Officials Gardens, Playing Fields, etc.

"2. The Palace Gardens are the nearest approach to a Botanic Garden in the real sense of the word, in that they contain a fairly representative collection of all the decorative plants grown in the country. They are 13 acres in extent, and were established in 1903.

"3. Mr. F. S. Sillitoe, M.B.E., A.H.R.H.S., was Superintendent of these Gardens from 1903 until 1930, when I took over control." (*Fide* Letter of March 1, 1938, from J. Robbie, Inspector of Horticulture, Government Gardens.)

Note: A news item in *Nature*, Nov. 6, 1919, p. 263, refers to a "botanic garden" at Khartoum.

Argentina

BUENOS AIRES

JARDIN BOTÁNICO MUNICIPAL

Calle Santa Fé 3951 (Palermo)

Established: 1892. *Area:* 10 Hectares.

Directors: 1. Carlos Thays; 2. Benito J. Carrasco; 3. Pugonio Carrasco.

Serves as a public park. Open daily, 7 a.m. to sundown. *Library and Herbarium* (17,000 specimens. System of De Candolle). *Plantations*: Systematic, after De Candolle. 6133 species, including trees and shrubs. *Publication*: Seed List. *Lectures* are given to classes, and study collections are loaned to schools. Living matter is supplied for study to local schools.

LA PLATA

JARDIN BOTÁNICO DE LA FACULDAD DE AGRONOMIA DE LA
UNIVERSIDAD NACIONAL
Llavallol, F. C. S.

Australia

ADELAIDE

BOTANIC GARDEN

North Terrace, Adelaide, South Australia

Established: 1855. *Area*: 40 acres.

Directors:

1. George Francis (March 10, 1855–1865)
2. R. Schomburgk (1865–1891)
3. M. Holtze (1891–1917)
4. J. F. Bailey (1917–1931)
5. H. Greaves (July 1, 1931–, 40 years service in the Garden)

Public Park: Adjoining the Garden there is a Botanic Park of 60 acres which serves as a public park. Open free daily, 7 a.m. to sunset. *Source of income*: Government grant, and rent of Kiosk. *Library*: 1000 books in public library; 400 books in office. *Herbarium*: 12,000 sheets. *Arboretum*. *Museum*: Open free from 9 a.m. to 4:30 p.m. Supplies living specimens for the Botany Department of the University.

BRISBANE (1)

BRISBANE BOTANIC GARDEN

Botanic Gardens, Brisbane, Queensland

Established: 1855. *Area*: 48 acres.

Directors (Curators):

1. Walter Hill (1855–1881)

2. James Pink (1881-1886)
3. A. M. Cowan (1886-1889)
4. Phillip McMahon (1889-1905)
5. J. F. Bailey (1905-1917)
6. E. W. Bick (1917-)

Serves as a public park. Open free to the public daily from sunrise to sunset. *Source of Income:* Brisbane City Council. *Note:* In 1925 the Government transferred the Botanic Gardens and Staff to the Brisbane City Council, and made that corporation solely responsible for the financial support, but kept the Botanic Museum and the Herbarium in their control, under the direction (March, 1937) of Mr. C. T. White, Government Botanist, still (1938) in office. *Library:* (At the Museum) 5000 volumes, plus pamphlets not indexed. *Herbarium:* 100,000 specimens. *Museum:* Open free, daily, 9-5 (Saturday, 9-12), except Sundays and public holidays. Living material for study is supplied chiefly to University of Queensland and Pharmacy College. *Affiliation:* The Garden is not affiliated with the University, but the University is adjacent to the Garden and the Technical Schools, and professors, lecturers, and students can obtain any specimens desired. (See Brisbane (2).)

BRISBANE (2)

SHERWOOD ARBORETUM

Director: E. W. Bick (1938). *Area:* 34 acres.

Located about nine miles from Brisbane, controlled by Brisbane Botanic Garden, under Brisbane City Council. A growing collection of Australian trees, many of which have produced seed offered in exchange. See Brisbane (1).

MELBOURNE

BOTANIC GARDENS AND NATIONAL HERBARIUM

South Yarra, Melbourne SE. 1. Victoria

Established: 1846. *Area:* 100 acres.

1846 *fide* reply to our questionnaire. Some publications give 1842. This is the date when "Mr. Hoddle, Surveyor-General," selected a site, which was never used.

Directors (Curators):

1. John Arthur (March 1, 1846-January, 1849)
2. John Dallachy (1849-1857)

3. Baron Sir Ferdinand von Mueller (1857–1873)
4. William R. Guilfoyle (1873–1909)
5. John Cronin (1909–1923)
6. William Laidlaw (1923–1925)
7. F. J. Rae (1925–)

Serves as a public park. Open free, daily, 7 a.m. to sunset (6 mos.) ; 7:30 a.m. to sunset (6 mos.). *Source of income:* Governmental appropriation. *Library:* Reference. About 10,000 volumes and 1000 pamphlets. *Herbarium:* "Many thousands." Actual number unknown; estimated about 1,500,000. The National Herbarium with associated Botanical Library has now (1934) been combined with the Garden's Herbarium and Library. The National Herbarium, established by von Mueller, "contains perhaps the most complete and valuable collection known of Australian dried plants." *Plantations:* Systematic, with special reference to the use of students. Species under glass: Several thousand. *Herbaceous plants out of doors:* Several thousand species. (Approx. 10,000 species.) *Publications:* Catalogue of Plants. 1883. Handbook and Guide to the Gardens. 1908. Seed List. 1911 (Australian seeds only). *Museum:* Economic botany and plant products. Open free, week-days, 9 a.m.–5 p.m., Saturdays, 9–12. *Study material:* Living material, including wild plants, is supplied to both public and private schools, in some cases regularly, in others occasionally on request. Some classes and colleges depend upon the garden for all their study material.

PERTH

STERLING GARDENS

Perth, Western Australia

Established: 1840. *Area:* 6 acres.

Director (Head Gardener): John Gates (1929).

Note: The Secretary, State Gardens Board, Premier's Department, Perth, writes: "There is no properly organized Botanic Garden in Perth; our city gardens more properly come under the heading of 'Rest Parks.'" This information is recorded here because this park is sometimes referred to in print as a "botanic garden."

ROCKHAMPTON

ROCKHAMPTON BOTANIC GARDENS

Queensland

Established: ? *Area:* About 200 acres.

Directors: 1. J. S. Edgar (—1901); 2. R. Simmons (1901–1932); 3. H. George Simmons (1932–).

Both scientific and commercial. *Serves as a public park.* Open free daily, 7 a.m.–sunset. *Source of income:* Rockhampton City Council and sales of plants. *Library:* None. *Herbarium:* “Some hundreds; increasing.” *Lectures to school children* are given “by arrangement.” *Supplies living material to schools* on request.

SYDNEY

BOTANIC GARDENS OF NEW SOUTH WALES

New South Wales

Established: 1816. *Area:* Garden 62 acres; park 129 additional acres.

Directors (Curators):

1. Charles Frazer (1828–1831)
2. John McLean (1832–1833)
3. Richard Cunningham (1833–1835)
4. James Anderson (1835–1837)
5. Allan Cunningham (1837–1838)
6. James Anderson (1838–1842)
7. William Robertson (1842–1844)
8. James Kidd (1844–1847)
9. John Carne Bidwell (1847–1848)
10. Charles Moore (1848–1896)
11. John Henry Maiden (1896–1924)
12. George Percy Darnell Smith (1924–1933)

(The title “Director” was discontinued on the retirement of Dr. Darnell Smith)

Botanist and Curator, National Herbarium:

13. Edwin Cheel (1933–1936)

Curator of Gardens:

- 13a. E. N. Ward, Curator of the Gardens (1933–1934)
14. G. F. Hawkey (1934–)

Serves as a public park. Open free daily, 7 a.m. to 6 p.m. in summer; 7 a.m. to 5 p.m. in winter. *Source of income:* Annual appropriations by the State. *Library:* Reference. About 5000 volumes and 10,000 pamphlets. *Herbarium:* About 500,000 specimens (phanerogams and cryptogams). *Museum:* Open free, Mondays to Fridays, from 11 a.m. to 5 p.m. Students from the University attend for lectures on Forestry and special studies. *Living material for study,* including native plants, is supplied to botany classes, and a limited number of herbarium specimens for special study at High Schools. Exchanges are made with leading Botanical Institutions throughout the world.

Austria (now, 1938, Germany)

GRAZ

BOTANISCHER GARTEN DER UNIVERSITÄT

Holteigasse 6, Graz III

Established: 1888–1889. *Area:* 2 hectares, 30 ares.

Director: Felix J. Widder (1936–)

Open weekdays, 7 a.m. to 6 p.m.; Sundays, 7 a.m. to 12 noon. *Source of income:* Confederation Ministry for Instruction (Bundesministerium für Unterricht). *Library:* Reference, about 1000 volumes. *Herbarium:* That of the Institute für systematische Botanik of the University. *Publication:* Samentauschverzeichnis.

HATZENDORF

HORTUS BOTANICUS EXPERIMENTALIS HATZENDORF

Hatzendorf b. Fehring, Steiermark

Proprietor: Fritz Lemperg (1936).

Area: 3 hectares. Open free daily. *Source of income:* Private funds. *Library:* About 300 volumes. *Plantations:* Ecologic. *Arboretum.* *Fruticetum.* *Publication:* Index Plantarum.

INNSBRUCK

BOTANISCHER GARTEN DER UNIVERSITÄT INNSBRUCK

Botanikerstr. 7, Innsbruck (Hötting)

Established: Old Garden near the University in the City, 1793.

New Garden, 1909, at Hötting on south side of the Nordkette (Alps). *Area:* 20,000 sq. meters.

Directors:

Joseph August Schultes (1808, 1 year)

Johann Fries (1819–1848)

Anton Fuchs (1849–1850)	Johan Peyritsch (1878–1889)
Anton Kerner	Emil Heinricher (1889–1928)
von Marilaun (1860–1878)	Adolf Sperlich (1928–)

Note: Between Friese and Kerner there were five “acting directors” (*Vertreter*), *fide* E. Heinricher (*Geschichte des Bot. Gart. der Univ. Innsbruck*. Jena, 1934, p. 6).

Serves as a public park, open free daily. *Source of income:* Appropriations from the State. *Annual budget:* 1. The employees of the Garden and Institute are State employees. Building improvements and alterations are made by the University building administration. Since the economic crisis of 1931 governmental appropriations have been entirely abolished and the Garden is now supported by the income derived as admission fees and fees of students. *Library:* There is no separate library apart from that of the Botanisches Institut, which is in charge of the Director of the Garden. *Plantations:* (*A*) Trees, shrubs and herbaceous plants are in systematic arrangement. In the Monocotyl section the arrangement is geographic and ecologic (plant societies). (*B*) Ecological and physiological groups according to Heinricher. (*C*) Aquatic plants. (*D*) Alpine plants, in two groups—Alps proper; other mountains. (*E*) Plants of the Caucasus. (*F*) Plants of Northeastern America. (*G*) Poisonous plants. (*H*) Scientific experimental garden (not open to the public). *Publication:* Samen Tauschkatalog. *Museum:* A part of the Botanical Institute. *Loan collections:* Herbarium is open to all scientific workers and loans to local schools such material as is available. *Study material:* A section of the Garden has been devoted to genetical and physiological experiments. The Garden is devoted primarily to the botanical instruction in the University.

Note: In 1793 Matheus Schöpfer maintained a house and garden of 343 square fathoms (“*Quadratklafter*”). This was the oldest “botanic garden” in Innsbruck. At the Hötting site Heinricher installed an ecological grouping, which was later imitated at Munich, Berlin, and elsewhere. There were 12 groups, as follows: (1) Compass plants, and others whose leaves were alike on the upper and under sides; (2) “Night-sleeping plants”; (3) Parasites; (4) Dissemination of fruits and seeds; (5) Insectivorous plants; (6) Bog-plants; (7) Climbing plants; (8) Hybrids; (9) Abnormalities (Teratology); (10) Cultivated varie-

ties; (11) Thorns and briers; (12) Leafless and nearly leafless plants. (De Vries. De botanische tuine te Innsbrück. Supplement to E. Heinricher, l.c., p. 36.)

KLAGENFURT

BOTANISCHER GARTEN DES NATURHISTORISCHES LANDESMUSEUM
RUDOLFINUM
Museumgasse 4

KREMSMÜNSTER

BOTANISCHER GARTEN DER OBERGYMNASIUMS DER
BENEDIKTINER IN KREMSMÜNSTER

Benediktiner Stift, Kremsmünster, Upper Austria

Established: 1889. *Area:* 3187 sq. m. (0.3187 hectare).

Directors (Kustos):

Father Anselm Pfeiffer (1889–1902)

Father Leonhard Hugerer (1902–?)

Source of income: Endowment. *Library:* Reference, only. About 1000 volumes, and about 200 pamphlets. *Herbarium:* More than 500 specimens. *Plantations:* Systematic, ecologic (biological groups), Alpine plants, small arboretum and fruticetum.

LINZ

BOTANISCHER GARTEN DER STADTGEMEINDE LINZ

(Variant: Botanischer Garten der Landeshauptstadt)

Dinghoferstrasse, Linz, an der Donau (Oberösterreich)

(The garden is still at the same location where it has always been. However, Gemeindestrasse has been changed to Dinghoferstrasse. A letter of March 8, 1938, from Der Baudirektor, Stadtbauamt Linz, states that the Garden is to be moved to a new location, and revision of the following statement was reserved until the transfer is completed. The statement is retained for its historical value.)

Directors: Franz Zischka, Franz Wüle.

Open free, daily, 8–12 a.m., 2–6 p.m. on week-days; 8–12 a.m. on Sundays and holidays.

Source of income: Appropriation by city. *Library:* Small. The Upper Austria Landesmuseum has a library of natural science of 15,000 volumes and 187 journals currently received. *Herbarium:* The Upper Austria Landesmuseum has a large herbarium. *Plantations:* 1. Large alpine garden; 2. subalpine meadows; 3. water and swamp plants; aquatic plants and ferns; 4. Pannonic and Pontic Flora (1–4, together, over 6000 species). Systematic, with a particular reference to local flora (about 1000 species). *Conservatories:* More than 1200 species, especially Cacti and Succulents. *Publication:* Samentauschliste.

Garden is visited by more than 130 school classes during the year.

Legally protected plants are shown three times a year to government officials. Plants are supplied to schools for study.

The former owner of the Botanic Garden was the "Verein für Naturkunde in Linz." On account of conditions after the World War this organization was discontinued in 1922 and since then the City of Linz administers the Botanic Garden.

The members of the "Verein für Naturkunde" joined the Oberösterreichischen Museumverein in Linz, which was founded in 1833. This scientific society of Upper Austria, with more than 1000 members, supports the Landesmuseum (since 1920 in the possession of Upper Austria) through publishing a "Jahrbuch," and by exchange of journals and scientific cooperation.

SALZBURG

BOTANISCHER GARTEN

Established: 1835. *Area:* 3000 sq. meters.

Directors:

1. George Hinterhuber, Apotheker (1835)
2. Franz Schuh (1836–1837)
3. Josef Karl Holfstein (1837–1842)
4. Gustav Wolf (1842–1849)
5. Johan Biatzovsky (1850–1863)
6. Karl Aberle (1863–1880)
7. Eberhard Fugger (1881–?)

Serves as a public park. Open free daily, April 1 to October 1, 8–10 a.m. and 2–6 p.m. Sundays and holidays, 8–10 a.m. *Library:* Reference. *Herbarium:* More than 3000 specimens. *Plantations:* Local flora of Salzburg and economic plants. *Publication:* Seed List. *Study material:* Living material, including wild plants, supplied when requested to local public schools.

SCHÖNBRUNN (VIENNA)

BUNDESGARTEN SCHÖNBRUNN

Schlosshauptmannschaft Schönbrunn, Gartenreferat

Established: 1740. *Area:* 199 acres of park and garden.

Open to the public daily, sunrise to sunset, except the "Reserve Garden" and the cultivated areas. *Source of income:* Entrance fees to the Palmhouse and flower shows, rentals, etc. The garden is owned by the state, and is in the palace grounds in the southwestern outskirts of Vienna. *Library:* Small working library for reference. Laid out in the French style of 200 years ago, with espalier work and formal planting; a small *Arboretum*. School classes are conducted through the Palmhouse on request, and small plants, twigs, and flowers are supplied for study to schools.

VIENNA (1)

BOTANISCHER GARTEN UND BOTANISCHES INSTITUT DER
UNIVERSITÄT WIEN

Rennweg 14, Wien III

Founded: 1754. *Area:* Almost 8 hectares (19.76 acres).

Directors:

1. Robert Laugier (1754–1768)
2. Nicolaus Josef Freiherr von Jacquin (1768–1796)
3. Josef Franz Freiherr von Jacquin (1796–1839)
4. Stephan Ladislaus Endlicher (1839–1849)
5. Eduard Fenzl (1849–1878)
6. Anton Kerner Ritter von Marilaun (1878–1898)
7. Richard Wettstein Ritter von Westersheim (1899–1931)
8. Friedrich Knoll (April 1933–)

General admission free. Open from 7 a.m. until sunset, April 1st to October 31st.

Source of income: Part of lecture fees from the University of Vienna (Philosophical faculty). Wages for garden workers are paid by the Government (Ministry of Instruction). *Library:* (1934) about 10,000 volumes and 10,000 pamphlets. Periodicals, about 80. *Herbarium:* About 1,000,000 species from all departments (Thallophyta, Bryophyta, Pteridophyta, Anthophyta). *Departments of the Garden:* Systematic, geographic, ecologic, economic. Greenhouses (7 hothouses, 6 coldhouses). Experimental Garden for special cultures and research. *Greenhouse plants:*

About 5000 species. *Out-door plants*: (Woody plants and herbs together) about 2000 species. *Botanic Museum*: Open free to public every Saturday from 9 a.m. to 12 noon. To Scientists, open at all times upon application to the Director's office. Contains about 3000 objects, partly dry and partly preserved in liquid. *Picture collection*: About 6000 pictures (incl. portraits) ; 2000 photographic negatives. All aforesaid collections are for use only in connection with the University lectures and for scientific research of the University, and are not loaned for other purposes nor to other persons. *Publication*: Samen-Tauschlist.

VIENNA (2)

BOTANISCHER GARTEN IM BELVEDERE

Prinz Eugenstrasse 27, Belvedere, Wien III/40

Director: Franz Metschkal (1936). Samentauschliste.

Belgian Congo

EALA

JARDIN BOTANIQUE D'EALA

Eala, Congo Belge, Africa

Established: 1900. *Area*: Jardin Botanique 20 hectares; Champs d'essais, 200 hectares.

Directors:

1. León Pynaert (1900–1908)
2. Moreel Laurent, acting (1903–1904, 1906–1907)
3. Félix Séret (1908–1910)
4. Acting Directors (1911–1914); Brown (1911); Lefèvre; Vendelmans; Dauvrin; Bonnivair; Nannan
5. Vermoesen (1914–1915)
6. Acting Directors (1915–1917): Danorin; Lamboray
7. Risch (1917–1919)
8. Bogemans (1919–1920)
9. Groossens (1920–1928)
10. Cerbissier-Baland (1928–1933)
11. G. Gilbert, acting (1933–1934)
12. J. Leemans, acting (October, 1934–June, 1936)
13. G. Cuteaux, Conservateur (July, 1936–)

Source of income: Appropriations from the Colonial Government through the Institut National Pour l'Étude Agronomique du Congo Belge. *Library:* Reference. 1000 volumes, 2000 pamphlets. Current periodicals received, 75. *Herbarium:* 3000 specimens. *Plantations:* Systematic; Arboretum; Fruticetum. *Herbaceous plants outdoors:* 2200. *Publications:* Catalogue des végétaux (1924). "Communications" (in Bull. Agricole du Congo Belge). *Small museum.* This Garden is administered by La Section des Recherches Scientifiques, of which J. Louis is Chief.

ELISABETHVILLE

ARBORETUM DU COMITÉ SPÉCIAL DU KATANGA

Route de l'Étoile

Belgium

ANTWERP

JARDIN BOTANIQUE DE LA VILLE D'ANVERS

Rue Léopold 24, Antwerp, Belgium

Established: 1809. *Area:* About one hectare.

Directors:

Verbert (?)	Henri de Beukelaer (1909—)
Sommeé (?)	E. J. B. Verleyen, Jr. (1936)
Henri Van Heurck (1874—1909)	

Serves as a public park. Open free daily, 6 a.m. to 7 p.m. in summer; 7 a.m. to 4 p.m. in winter. *Source of income:* Municipal appropriations. *Library:* Reference only. *Herbarium:* 300,000 specimens. *Plantations:* Systematic (following *Prodromus* of de Candolle); morphological; biological. *Publications:* Annual report, Seed List. *Museum:* Open to the public free, Sundays and holidays, 9 a.m. to 5 p.m. *Lectures to school children* at the garden about 35 annually, in addition to other public lectures. *Study collections* are loaned to schools as follows: herbarium specimens, dried seeds, alcoholic material, microscopic slides, lantern slides, economic plant products. *Living material* for study is supplied to schools. Both public and private schools are supplied on request. Local schools depend upon the garden for all their study material. Courses of instruction in botany and microscopy.

AUDERGHEM

JARDIN EXPÉRIMENTAL JEAN MASSART

Chaussée de Wavre, 1850

Established: 1928. *Area:* More than 4 hectares.*Director:* Alexandre Conard (1937).

This Garden was begun in 1922 by Jean Massart, who died August 16, 1925. His colleagues, students, and other friends formed an association to continue his work at the same place (Rouge-Cloître, Auderghem, southeast of Brussels). The association has the same name as the Garden, which has six departments: 1. Jardin expérimental; 2. Jardin botanique; 3. Arboretum; 4. Collection of roses; 5. Large pond; 6. Laboratory.

The Jardin Botanique is arranged on the basis of "Ethology," which was Massart's main botanical interest. The Garden, we are told, is laid out like a beautiful park, the dominating idea being ecology. The plants are grouped according to the principal ecological associations which are found in Belgium—*Les Naturalistes Belges* (*Bull. Mensuel*). No. 7. July, 1928.

Publication: Liste de Graines Récoltées. *Affiliation:* Université Libre de Bruxelles.

BRUSSELS

JARDIN BOTANIQUE DE L'ÉTAT

(RIJKSPLANTENTUIN)

236 Rue Royale, Bruxelles, Belgium

Established: July 1, 1870. *Area:* 16 acres.*Directors:*

1. Francois Crépin (1876–1901)
2. Théophile Durand (1902–1912)
3. Émile De Wildeman (1912–1931)
4. Walter Robyns (1931–?)
5. Alexandre Conard (1934)

Open free, daily. *Source of income:* Ministère de l'Agriculture. *Forestry Museum:* Open daily 2 to 5 p.m. *Library:* 85,000 volumes and pamphlets. *Herbarium:* 1,100,000 specimens. *Plantations:* Systematic, Engler and Prantl system, especially succulents; Geographic (plants of Belgian Congo). *Conservatory:* About one acre under glass. *Publications:* Bulletin du Jardin Botanique de l'État (2 numbers a year). Seed List.

GENT (GAND)

JARDIN BOTANIQUE DE L'UNIVERSITÉ DE L'ÉTAT

Rue Ledeganck 31

Director: Couret de Villeneuve (1800 or 1801-?).

LAEKEN

JARDIN COLONIAL DE LAEKEN

No. I, Avenue Jean Sobieski, Brussels II

Established: 1900. *Area:* About 3 hectares (of which 16 ares are under glass).*Directors:* René Kinds (1900-1934); Léon Pynaert (1934-)

Open, free, daily as authorized. *Source of income:* Appropriations by the Congo Government. *Library:* A library of Colonial Agriculture is developed by the Ministry of Colonies, 7, Place Royale, Brussels. The Jardin Colonial de Laeken uses this source of documentation as well as the library of the Government Botanic Garden, 236, rue Royale, Brussels. *Herbarium:* The herbarium of the Congo plants is kept at the Government Botanic Garden, Brussels. *Plantations:* Plants are arranged according to origin, use and mode of culture. *Species under glass:* 900-1000. *Laboratories:* Some crops of economic and medicinal products are studied and analyzed by the Laboratoire de Recherches Chimiques et Onialogiques of the Ministry of Colonies, rue de Moulin, No. 1 Tervueren, and by other Laboratories. *Publications:* Seed list. Bulletin Agricole du Congo Belge, edited by the Ministry of Colonies. *Instruction:* Agriculturists wishing employment in the colonial service fulfill a term of probation. School children are guided in the garden by their teachers who find opportunity to speak with interest about the origin of colonial and various economic products. A small museum aids in the teaching. Living material of colonial economic plants is supplied to both public and private schools when requested.

The Jardin Colonial de Laeken belongs to the Direction of Agriculture of the Ministry of Colonies and was organized by a decree of the 3rd of February, 1900. The object is: To obtain plants and seeds of useful species from tropical origin; to cultivate and propagate them; to forward these to the government probation gardens in Belgian Congo and to similar establishments from foreign countries; to help private colonists, planters, and companies to purchase, pack, and forward to the Congo the seeds and plants which they wish to grow in the Colony.

LIÉGE

JARDIN BOTANIQUE DE L'INSTITUT BOTANIQUE DE L'UNIVERSITÉ
D'ÉTAT

3 rue Fuchs

Established: 1835. *Area:* 4 hectares.

Directors:

1. Charles Morren (1835–1856)
2. Edouard Morren (1857–1887)
3. Auguste Gravis (1887–1927)
4. Raymond Bouillenne (1927–)

Serves as a public park. Open, free, daily at all hours. *Source of income:* State (University) governmental appropriations. *Library:* Bibliothèque de l'Institut, 2000 volumes, 10,000 separata, 250 Revues and Periodicals. *Herbarium:* 10,000 specimens. *Arboretum and Fruticetum.* *Plantations:* Systematic. *Publications:* Archives de l'Institut de Botanique de l'Université de Liège. *Lectures:* Special lectures are given to school children at the Garden, and the Garden supplies living matter to the schools for study. Garden devoted to systematic, physiological and ecological studies for University workers, students, and professors. 17 greenhouses, of which two are devoted to the famous collection of Bromeliaceae started by Prof. Dr. Edouard Morren in 1856.

LOUVAIN

JARDIN BOTANIQUE DE LA VILLE

Voer des Capucins

TERVUEREN

ARBORETUM GÉOGRAPHIQUE

Director: C. Bommer (1937).

Bermuda

PAGET EAST

THE PUBLIC GARDEN

Agricultural Station, Paget East, Bermuda

Established: 1898 (1897?). *Area:* 20 acres.

Directors: G. A. Bishop (1897–1904); T. J. Harris (1904–1910); W. R. Winter (1910–1914); E. J. Wortley (1914–1920); E. A. McCallan (1920–1934); T. A. Russell (1935–).

Serves as a public park. Open free, daily, 7 a.m. to 6 p.m. *Source of income:* Governmental appropriations. *Library:* Small reference only. *Herbarium:* About 700 sheets. *Plantations:* "Contains a small quantity of economic and ornamental plants from many parts of the world," arranged in economic groups and ecologically. *Publications:* Annual Report and scientific bulletins, published by the Department of Agriculture. A Guide Book to the plants in the Garden is in course of preparation (Feb. 1938). *Lectures to school children* given occasionally by arrangement. *Note:* The Garden is located somewhat less than one mile from the City of Hamilton. (According to *Nature*, Nov. 6, 1919, p. 263, there was an earlier garden, established 1871.)

Brazil

PARA

HORTO BOTANICO

Director: Jacques Huber (Died, 1914).

RIO DE JANEIRO (1)

JARDIM BOTANICO DO RIO DE JANEIRO

Established: 1808. *Area:* 54 hectares.

Directors: João Barbosa Rodrigues (1896, 1909); John Christopher Willis (1912); Alexandre Curt Boade (?); P. Campos Porto (May, 1934—).

Open to the public "as an educational park," daily, 7 a.m. to 6 p.m. *Source of income:* Governmental appropriations. *Library:* About 3000 volumes, "2219 periodicals." *Herbarium:* 100,000 sheets. *Plantations:* Systematic, geographic, economic, ecologic. *Arboretum.* *Publications:* Archivos do Instituto de Biologia Vegetal; Rodriguezia (issued by the Instituto). *Museum* of Carpology, open free, 11 a.m. to 5 p.m. Supplies study material and loan collections to schools. See Sao Paulo (2).

RIO DE JANEIRO (2)

RESERVA FLORESTAL DE ITATIAYA

The "Reserva florestal de Itatiaya" (formerly "Estação Biologica de Itatiaya") is a nature preserve ("wild life sanctuary"), of about 11.9 ha., affiliated in 1932 with the Jardim Botânico do Rio de Janeiro. This is located on the Rio de Janeiro-São Paulo railroad, about half way between these two cities (Station Homem de Mello); altitude, 800 meters, on the slopes of the 3000 m. high Itatiaya Mts. There are numerous resting points at various elevations.

SÃO PAULO (1)

HORTO OSWALDO CRUZ

Instituto Butantan, Caixa postal, 65

Established: 1917.*Director:* Afranio do Amaral (1938).*Source of income:* Governmental appropriations. *Herbarium:* About 300 specimens. *Museum:* Open daily, 8 a.m.—4 p.m.

SÃO PAULO (2)

PARQUE E JARDIM BOTANICO DO ESTADO

Caixa Postal 2.164, S. Paulo (Orquidário)

Established: November, 1929. *Area:* 100 alqueires.*Director:* F. C. Hoehne (1929—).

Serves as a public park. Open free on holidays and Sundays. *Source of income:* Governmental appropriations. *Herbarium:* 40,000 numbers. *Plantations:* Ecologic. "It is a nature park; most of the plants are in natural formations." *Arboretum.* *Fruticetum.* *Publication:* Arquivos de Botânica de São Paulo. *Study material* supplied to local schools. Exhibitions of orchids are held in March–April and October–November. *Affiliation:* Secretaria de Agricultura, Industria e Commercio de São Paulo. The Serviço de Botânica e Agronomia also administers the Estação Biologica at Alto da Serra with more than 5,000,000 square meters of "virgin woods and camps."

British Guiana

GEORGETOWN

GEORGETOWN BOTANIC GARDENS

Established: 1879. *Area:* 184 acres.*Directors:* George Samuel Jenman (1879–1902) ; John Burchmore Harrison (1909–1925) ; J. Sydney Dash (1927—).

Serves as a public park. Open free to the public daily from 7 a.m. to 6 p.m. *Source of income:* Supported by Government. *Library:* Small. *Herbarium:* Approximately 20,000 specimens. *Publications:* Plant and Seed Exchange List. Guide. Devoted to ornamental and experimental horticulture. A few lectures are given to teachers and school children at the Garden. Supplies liv-

ing material for study to local schools. This is the largest botanic garden in any British colony of the Western Hemisphere.

NEW AMSTERDAM

NEW AMSTERDAM BOTANIC GARDEN

c/o Agricultural Superintendent, New Amsterdam, Berbice

Established: 1885. *Area:* About 2 acres.

Direction: In immediate charge of the Superintendent of the Department of Agriculture. *Keepers:* Richard Hunt (1896, 1902); J. Nordamoonie (1909).

This garden is merely "a small public park for the benefit of the residents of New Amsterdam. . . . Supported by a small grant from Government."

British New Guinea

RABAUL

(DEPARTMENT OF AGRICULTURE BOTANIC GARDENS)

On New Britain Island. See page 310

BRITISH WEST INDIES

Antigua

ST. JOHNS

BOTANICAL GARDENS

Dominica

ROSEAU (formerly Charlotte Town)

BOTANIC GARDENS OF DOMINICA

Roseau, Dominica, Leeward Islands, B. W. I.

Established: 1889. (Site purchased, Jan. 1891.) *Area:* 44 acres.

Directors (Superintendents):

1. Charles Murray (1889–1890)
2. Henry F. Green (1890–1892)
3. Joseph Jones (1892–1923)
4. F. G. Harcourt (1924–)

Serves as a public park. Open free daily. *Source of income:* Government grant. *Library:* About 300 volumes; numerous pamphlets. *Plantations:* Decorative and economic. *Arboretum.* *Fruticetum.* *Publication:* Annual Report. *Special lectures* are given to school classes at the Garden.

Affiliation: Imperial College of Tropical Agriculture, Trinidad.
Botanical investigation is carried on at the College, but the Garden is maintained for agricultural experimentation.

Grenada

ST. GEORGE (ST. GEORGE'S)

BOTANIC GARDENS

Windward Islands, B. W. I.

Established: 1886. *Area:* 26 acres.

Directors: (Present title, Superintendent of Agriculture)

1. William R. Elliott (1886–1889)
2. Charles M. Murray (1890)
3. George Whitfield Smith (1890–1894)
4. Walter E. Broadway (1894–1904)
5. R. D. Anstead (1904–1909)
6. Gilbert Auchinleck (1909–1914)
7. John Chisnall Moore (1914–1919)
8. R. O. Williams (1919–1921)
9. W. O'Brien Donovan (1921–1929)
10. K. T. Rae (1929–1931)
11. W. O'Brien Donovan (1931–)

Serves as a public park. Open free to the public daily, from 6 a.m. to 6 p.m. *Source of income:* Annual appropriations by the Island Government. *Library:* Reference, a section of the general library of the Department of Agriculture. 1500 volumes. *Herbarium:* 400 specimens. *Arboretum.* *Note:* "Until 1906 this garden was conducted by a Curator from Kew, but that year an Agricultural Department was created, with a qualified and experienced agriculturist at the head. At present the gardens are hardly botanic in a scientific sense, but are chiefly ornamental and used for the propagation of economic plants. The Department uses spare corners for minor economic experiments."

Jamaica

KINGSTON

GOVERNMENT BOTANIC GARDENS

Established: 1857. Abandoned for lack of Legislative appropriations, *Re-established* 1871.

Note: The Government Gardens comprise: 1. Hope Gardens (near Kingston); 2. Castleton Gardens; 3. Public Gardens, Kingston; 4. Hill Gardens, Cinchona; 5. King's House Gardens and Grounds; 6. Gordon Town Garden; 7. Bath Garden and Nursery, St. Thomas.

Directors: William Fawcett (1886–1908) Director, Botanic Gardens and Plantations. William Harris (1908–1920) Superintendent, Public Gardens and Plantations. M. S. Goodman (1920–), Superintendent of Public Gardens.

Hill Gardens, or “*Government Cinchona*,” is a reservation of several thousand acres, where the Cinchona tree (source of Peruvian bark and quinine) was introduced into cultivation about 1870. Sir Basil Keith first conceived the idea of this Garden in 1774. The plan was first realized in 1869 under Gov. Sir John Peter Grant. In August, 1903, the Jamaican Government leased the property to the New York Botanical Garden by whom it was maintained as a laboratory and sub-station for the propagation of tropical plants for about ten years, when the lease was terminated and the Gardens were taken over again for administration by the Government.

St. Lucia

CASTRIES

BOTANIC GARDENS

Windward Islands, B. W. I.

Established: 1887. *Area:* 7.5 acres.

Directors (Agricultural Superintendents):

1. John Gray (1887–1895)
2. John Chisnall Moore (1895–1914)
3. Archibald Joseph Brooks (1914–1922)
4. Ernest Alfred Walters (1922–1937)
5. Gerald Barnard Gregory, Acting (1937–1938)

Serves as a public park. Open free, daily, 6 a.m. to sunset. *Source of income:* Annual votes by the local government. *Library:* Reference. About 420 volumes. *Plantations:* Decorative only. *Publications:* Annual Report, Pamphlets. *Lectures:* Oc-

casional lectures to school teachers. *Note:* Under the same administration is the Union Experimental Station, of about 150 acres, reestablished in 1929; plantations economic and ornamental. "The staff of the agricultural department directs agricultural training in the primary schools, gives occasional lectures to school teachers, visits and advises planters and peasants on practical agricultural matters, conducts experiments in cultural methods on estates and at the experiment station, and raises and distributes at nominal charges such economic plants as are required for estate planting, besides introducing and trying new plants." A few native pupils are trained in practical agri-horticulture.

St. Vincent

KINGSTOWN

ST. VINCENT BOTANIC GARDENS

Windward Islands, B. W. I.

Established: 1764. *Area:* 62 acres.

Directors:

1. George Young (1766–1785)
2. Alex Anderson (1785–1811)
3. William Lohead (1812–1815)
4. George Caley (1816–1822)
5. *Garden abandoned* (1822–1890)
6. Henry Powell (1890–1904)
7. William N. Sands (1904–1919)
8. Thomas P. Jackson (1919–)

Serves as a public park. Open free, daily, from sunrise to sunset. *Source of income:* Annual appropriations from Colonial Government. *Library:* Reference only. *Plantations:* A general collection of tropical trees and plants. *Publications:* Annual Report. Established 1890. Published by Imperial Department of Agriculture for the West Indies. *Affiliation:* The Imperial Department of Agriculture for the West Indies.

Tobago

In the *Handbook of Trinidad and Tobago* (1924) the following statement appears: "There is a Botanic Station . . . in Tobago, with similar functions to those of the Botanic Gardens . . . in Trinidad, and administered in close connection with them." (P. 147.) This Garden has an important collection of economic plants.

Trinidad

PORT OF SPAIN

ROYAL BOTANIC GARDENS

St. Clair, Port of Spain, Trinidad, B. W. I.

Established: 1818. *Area:* 67 acres in garden proper. A large area is held in wild vegetation.

Superintendents:

- | | |
|---------------------------|---------------------------------|
| 1. D. Lockart (1818–1846) | 5. John H. Hart (1887–1908) |
| 2. T. Purdie (1846–1854) | 6. J. B. Carruthers (1909–1910) |
| 3. H. Crueger (1854–1864) | 7. W. G. Freeman (1911–1922) |
| 4. H. Prestoe (1864–1886) | 8. R. O. Williams (1922–1934) |

Serves as a public park. Open free, daily, from sunrise to sunset. *Source of income:* Annual appropriation by the national government. *Library:* Reference. About 1000 volumes. *Herbarium:* About 15,000 specimens. *Plantations:* Economic, arboretum, fruticetum. *Species under glass:* Glass used very little, but Adiantums and other ferns are kept under partially glazed houses, with open sides. *Publications:* Flora of Trinidad and Tobago. Useful and ornamental plants of Trinidad and Tobago. Guide Book of the Royal Botanic Gardens. Seed List. Supplies study material to schools.

Bulgaria

SOFIA (1)

BOTANICAL GARDEN OF THE FACULTY OF AGRICULTURE

Established: 1921. *Area:* 1.5 hectare.

Directors: N. Stojanoff (1921–1936); M. Christoff (1936–).

Source of income: Governmental appropriations. *Library:* 600 volumes. *Herbarium:* About 50,000 specimens. *Plantations:* Systematic. *Publications* are issued periodically in the Yearbook of the University of Sofia, Faculty of Agriculture. Seed List.

SOFIA (2)

THE KING'S BOTANICAL GARDEN IN SOFIA

Royal Palace

Established: 1887. *Area:* About 2 square kilometers.

Directors:

1. Lauchot (1899–1912)

2. A. Delmard (1912–1919)

3. J. Kellerer (1919–)

Open free to scientists only. *Source of income*: H. M. The King of Bulgaria. *Library* (the botanical division of the library of the King's Natural History Museum): About 600 volumes. *Herbarium*: About 100,000 sheets. *Plantations*: Ecologic, ornamental. *Arboretum*. *Fruticetum*. *Publications*: Included in "Mitteilungen der Königlichen Naturwissenschaftlichen Institut." 10 volumes since 1928.

SOFIA (3)

INSTITUTUM EXPERIENTE AGRARIUM

Institut Central de Recherches Agronomiques d'État, Sofia,
Bulgaria

Note: Not a botanic garden, but publishes a Seed List (Delectus Seminum).

SOFIA (4)

BOTANIC GARDEN OF THE SOFIA UNIVERSITY

Faculty of Sciences, Sofia University

Established: 1892. *Area*: About 2 hectares.

Directors:

1. St. Gheorghieff (1891–1902) 3. N. Arnudoff (1936–)
2. St. Pethoff (1901–1936)

Note: "Every year one of the botany professors would be elected a director for one year only. Prof. N. Arnaudoff since 1922, Prof. N. Stoyanoff since 1936." The information under "Directors" follows exactly the data given on the returned questionnaire. The quotation is from the same questionnaire.

Serves as a public park. Open free daily. *Source of income*: The budget of the University. *Library*: That of the Botanical Institute of the University. *Herbarium*: That of the Botanical Institute (about 60,000 sheets). *Plantations*: Systematic, ecologic. *Arboretum*. *Publication*: Index Seminum. *Supplies living plant material* irregularly to local schools for study.

Burma

MAYMYO

GOVERNMENT BOTANIC GARDENS

Established: 1917. *Area:* 170 acres.

Directors (Superintendents):

1. Lady Cuffe (1917–1920)
2. C. R. P. Cooper (1920–1922)
3. C. T. Bogg (October, 1922–)

Serves as a public park. Open free daily. *Source of income:* Government grants. The Garden has the use of the Forest Department *Library and Herbarium*. *Plantations:* Systematic. *Arboretum*. *Fruticetum:* "Very small." *Publications:* Reports are included in the Forest Department Reports. *Special lectures* occasionally to Forestry students and school children. *Study material supplied* on request for classes in Rangoon University.

Cameroons

VICTORIA

VICTORIA BOTANIC GARDENS

Cameroons, West Africa

Established: 1892. *Area:* 60 hectares.

Directors:

1. Paul Preuss (1892–1902)
2. H. S. Strunk (1902–1904)
3. August Weberbauer (1904–1906)
4. Hermann Bücher (1906–1911)
5. Ernst Fickendey (1911–?)
6. Preuss (?)

Serves as a public park. Open free daily. *Source of income:* Allocation voted by Nigerian Government. *Library:* 60 volumes. *Herbarium:* About 3000 specimens. *Arboretum*. *Fruticetum*. *Plantations:* Geographic and economic. *Publication:* Annual Report incorporated in that of Nigerian Forestry Department. *Note:* The Victoria Botanic Gardens, the chief center of acclimation of the former German colonies, in West Africa, became Crown property when the German Kamerun was placed under a British mandate at the close of the World War.

Canada

MONTREAL

MONTREAL BOTANICAL GARDEN

(JARDIN BOTANIQUE DE MONTRÉAL)

4101 Sherbrooke Street East, Montreal, Canada

Established: 1936. *Area:* Nearly 600 acres.*Director:* Frère Marie-Victorin (1936—).*Publication:* List of Seeds, offered in exchange (specializing in interesting and little known Canadian plants).

Note 1: Construction work began in the spring of 1936. The Garden is administered by the Commission du Jardin Botanique de Montréal of five members, including the heads of the botanical departments of the University of Montreal and McGill University (Montreal). There is an administration building (erected by the City of Montreal), two greenhouses, and a nursery (*Science*, 84: 10, July 3, 1936). According to the article in *Science*, the first display unit to be laid out is an economic garden for school children and which in 1936, exhibited 124 varieties of fodder plants, grain crops, vegetables, oil-plants, etc.

Note 2: In the spring of 1937 a multigraphed memorandum was circulated among Dominion botanists by the Canadian Department of Agriculture, Experimental Farms Branch, Division of Botany, entitled: "Suggestions for the consideration of the members of the Botanical Committee of the National Research Council in relation to the establishment of adequate botanical services for the Dominion."

Topic No. 6 of this memorandum (pp. 10-16) is entitled, "National (Royal?) Botanical Garden or Gardens." Appendix "A" is entitled, "Suggestions for the establishment of a Canadian Botanical Service," signed by H. T. Güssow, Dominion Botanist.

Note 3: As of March, 1938, there was a bill pending in the provincial legislature to give the Garden a charter. The Montreal School Commission has assigned a teacher to give lectures to school children at the garden during the summer, in the schools in winter. A children's garden, for giving elementary instruction in gardening is being established (1938).

"We have started (March, 1938) the development of the first 250 acres of our garden; by the end of this coming summer we expect to have a large part of it finished. Six of our service greenhouses are finished; twelve more are now under construction. A new administration building which will include a large amphitheater, a special wing for the herbarium and another for the library, various laboratories, and offices is also under construction. We have constructed two large lakes and have made considerable progress with the construction of a very ambitious alpinum which on a series of small mountains will display the alpine flora of the world." (*Letter of March 9, 1938, from H. Teuscher, Superintendent.*)

Historical Note: In 1885 there was a movement to establish a botanic garden in Montreal. It was the announced intention of the promoters to make ample provision there for instruction in pure and applied botany. The institution was under municipal control and is stated to have been "killed by political differences in the City Council." The project failed in the same year in which it was started.

OTTAWA

BOTANIC GARDEN AND ARBORETUM

Division of Botany, Central Experimental Farm, Ottawa, Ontario,
Canada

Established: 1886. *Area:* 65 acres.

Directors: Wm. Saunders (1886–1911). Then transferred to The Dominion Botanist (Hans Theodor Güssow, 1911–).

Serves as a public park. Open free daily, from 7 a.m. to sunset. *Source of income:* Annual appropriations by the Dominion Government. *Library:* 1500 books, 15,000 pamphlets. *Herbarium:* About 22,600 specimens (Canadian flora only). *Arboretum:* About 2416 species and varieties of shrubs and trees. *Plantations:* Systematic mainly. *Herbaceous plants out of doors:* 2982 species and varieties. *Publications:* Seed Exchange List. The annual account of the work of the garden is contained in the Annual Report of the Experimental Farms Branch. *Material for study* is supplied to public institutions on request, so far as available.

TORONTO

There is a news item in *Science*, Vol. 82, p. 568, December 13, 1935, referring to a proposal then being considered to establish a botanic garden in Toronto. Sir Robert Falconer was reported to be Chairman of the Committee in charge of the project. It was stated that, "A ravine area in which the development of the native flora as well as plants from abroad could be effected" was favored by the Committee. *Note*: "Nothing new to report" (letter of Feb. 15, 1938).

VANCOUVER

UNIVERSITY OF BRITISH COLUMBIA BOTANICAL GARDENS
University of British Columbia, Vancouver, British Columbia

Established: 1912 as Government Botanical Garden (at Essondale, B.C.). 1916, transferred to University of B. C., at Vancouver.
Area: 5 acres.

Directors: John Davidson, Associate Professor of Botany, Founder, and Botanist in Charge (1912–).

Open free daily. *Source of income*: Budget of the University. *Library*: About 1200 volumes. *Herbarium*: About 20,000 specimens. *Plantations*: Systematic, economic, morphologic. Classified in beds according to Engler & Prantl. Medicinal, Rock, Aquatic, Japanese, and Local Flora gardens. *Arboretum* of native trees. *Salicetum*. *Publications*: Annual Reports (of the Botanical Office, Province of B. C.). Seed List. *Lectures* are arranged for visits of Societies, etc. *Supplies living material* for study to local schools occasionally.

Canary Islands

LA OROTAVA

JARDÍN DE ACLIMATACIÓN DE LA OROTAVA
Puerto de la Cruz, Tenerife, Canary Islands, Spain

Established: August 17, 1788. *Area*: 2 hectares.

Directors:

1. Marquis de Villaneuva del Prado (1788–1832)
2. Real Sociedad Económica de Amigos del País {

Vincente Fernandez	}	(1832–1851)
Juan Cologan		
Alfredo Diston		
José Quintero		
Carlos Benavides		
3. Gobierno Civil . {

Manuel Suárez	}	(1851–1888)
Bernardo Benítez de Lugo		
Nicolás Benítez de Lugo		
Utaldo Pimienta		
4. Ministerio de Agricultura {

Juan Pascuau Cerquella	}	(1888–1899)
Bernardo Jiménez		
Francisco Ullastres		
Pedro Gordon		
Francisco Menéndez Martín (1899–1929)		
Rodolfo Godinez (1929–1931)		
Carlos Solana (1931–1933)		
Jorge Menéndez Rodríguez (1933–)		
Andrés García Cabezón, Subdirector since 1934; fully in charge since 1937 due to temporary absence of Dr. Rodríguez.		

Serves as a public park. Open, summer (6 months), 8 a.m. to 6 p.m., Sundays and holidays, 12 m. to 6 p.m.; winter, 8 a.m. to 9 p.m.; Sundays and holidays, 12 m. to 9 p.m. Admission, one peseta for non-residents. *Source of income:* Mainly by appropriations from the Department of Agriculture of Spain. *Library:* 10,000 volumes. *Herbarium:* 7000 specimens. *Plantations:* Not classified. *Publications:* Official Catalog (1889, 1923); Descriptive Guide, in Spanish, English, and German (1938). *Supplies living material* for study to local schools.

Ceylon**GAMPAHA****HENERATGODA BOTANIC GARDENS**

Established: 1876. *Area:* 36 acres.

Direction: Under the director of the Royal Botanic Gardens, Peradeniya, and managed by successive curators. (Curator 1938, E. Perera.)

Serves as a public park. Open free daily, 6 a.m. to 6 p.m. *Source of income:* Governmental appropriations, and sale of seeds of Para rubber plants, Budweed, and ornamental and fruit plants and seeds. *Library:* Office reference only. *Plantations:* Systematic, economic. *Arboretum.* *Fruticetum.* Special lectures are given to school children and living material is supplied to schools for study.

Historical Note: "The land for these Gardens was opened in 1876 for the reception of the Para rubber plants sent, at the charge of the Indian Government, through the Royal Botanic Gardens, Kew. The site was selected because it was thought that the warmer and moister climate of a low-country station would be more suitable for the growth of *Hevea brasiliensis* than at Peradeniya. Trees of the original plantation are still to be seen, and No. 2 tree has a world wide reputation, as it yielded 392 lbs. of dry rubber in 4 years and 9 months. The seeds were obtained by Sir Henry Wickham from the forests of the Tapajoz Plateau in the valley of the Amazon."

HAKGALA

BOTANIC GARDENS (See Peradeniya)

Curator: J. J. Nock

PERADENIYA

ROYAL BOTANIC GARDENS

Established: 1810. Transferred from Slave Island to Peradeniya in 1821. *Area:* 146 acres.

Superintendents (Title abolished, 1857):

1. W. Kerr (1810–1814)
2. Alexander Moon (1817–1825)
3. Andrew Walker (Acting) (1825–1827)
4. James Macrae (1827–1830)
5. G. Bird (Acting) (1830–1832)
6. James George Watson (1832–1838)
7. J. G. Lear (Acting) (1838–1840)
8. H. T. Normansell (1840–1843)
9. W. C. Ondaatje (Acting) (1843–1844)
10. George Gardner (1844–1849)

11. G. Fraser (Acting) (March–December, 1849)
12. George Henry Kendrick Thwaites (1850–1857)

Directors (Curators):

13. George Henry Kendrick Thwaites (1857–1880)
14. Henry Trimen (1880–1896)
15. J. C. Willis (1896–1912)
16. H. F. Macmillan (1912–1913)
- Vacant, Spring 1913–1914
17. T. H. Parsons (1914–)

Serves as a public park. Open free daily. *Source of Income:* Government appropriations. *Library:* The old Royal Botanic Gardens Library was merged with the Department of Agriculture General Library in 1912. *Museum:* Contains a collection of economic plants of Ceylon. *Herbarium:* A general Herbarium in which the Ceylon indigenous, Ceylon cultivated, and foreign specimens are in separate covers. *Arboretum:* 55 acres established in 1914, a Palmetum of 5 acres in 1916, a Pinetum of 4 acres in 1921. *Research Laboratory.* *Publications:* Trimen has published a Catalogue of plants growing in the Gardens, also a "Hand-Guide to Peradeniya Gardens," which has passed through five editions. An "Alphabetical List of Plants Growing in the Gardens" was published in 1926, and a revision of the "Hand-Guide to Peradeniya Gardens" in 1927, by Parsons. "Annals of the Royal Botanic Gardens, Peradeniya," established in 1901. A "Journal of Pure and Applied Botany," containing chiefly the results of work done wholly or in part in the laboratories and herbarium of the Ceylon Garden, or upon materials supplied by the Garden. Also a "Circular," published at intervals. *Branch gardens:* There is a branch garden on the mountain at Hakgala, containing a large reserved area of both jungle and grass, and a collection of plants from Europe, Australia, South Africa, the Himalayas, and other tropical mountains. It also contains a small laboratory with living accommodations, and a small herbarium of the local flora and plants cultivated in the garden. There is also a Branch Garden at Heneratgoda, three hours ride from Peradeniya, and lying nearly at sea level. (See Gampaha.) Branch Gardens at Badulla, on the eastern side of the mountains, established, 1886; and a fourth at Anuradhapura, on the north side of the Island, established in 1883, were closed in 1906 when it was decided that the Department should devote greater attention to economic work and to agriculture.

Chile

CONCEPCION

JARDIN BOTÁNICO

This Garden, in process of formation, announces that it will offer, in exchange, seeds of species indigenous to Chile.

SANTIAGO

JARDIN BOTÁNICO

China

AMOY

HERBARIUM, BOTANICAL MUSEUM, AND GARDENS OF THE COLLEGE
OF SCIENCE OF AMOY UNIVERSITY

CANTON

It has been reported that there is a botanic garden at Sun Yatsen University, Canton. No reply has been received to our questionnaire sent to this University, and two Chinese graduate students of botany assured the author in June, 1937, that there was then no botanic garden as yet at Sun Yatsen University, although plans were under way for establishing one. (See Nan-king.)

HONG KONG (See **Hong Kong**)

KIUKIANG

LU-SHAN ARBORETUM AND BOTANICAL GARDEN

Kuling, P. O. Box 4, Kiukiang, Kwangsi Province

Established: About 1933. *Area:* About 50 acres.

Director: R. C. Ching (1937).

Plantations: A systematic Herbaceous Garden was inaugurated, April, 1936. *Arboretum.* *Fruticetum.* *Publications:* Annual Report (in Chinese and English); Seed List. *Affiliation:* Fan Memorial Institute of Biology, and Kiangsi Provincial Agricultural Institute. *Note:* The Garden aims to study plants, especially Chinese, in relation to forestry and horticulture. Special attention is being given to the vegetation of Mt. Lu-Shan, where the Garden is situated. Most of the local flora plants are being cultivated in the Garden. Special study of the ferns of China and Sikkim-Himalaya.

NANKING

BOTANIC GARDEN OF THE SUN YAT-SEN TOMB AND MEMORIAL
PARK COMMISSION

68 Ching Hsien Street

Director: H. K. Fu (1936). Seed List.

PEIPING

BOTANIC GARDEN, NATIONAL MUSEUM OF NATURAL HISTORY OF
PEIPING

The Director, Institute of Botany, National Academy of
Peiping, Hsi Chih Men Wai, Peiping, China

Established: April, 1930. *Area:* About 6 acres.

Director: Liou Tchen-Ngo (1930-?).

Serves as a public park. Admission free, daily. *Source of income:* From the Museum budget. *Library:* About 1157 volumes in the Library of the Institute of Botany, National Academy, Peiping. *Plantations:* Systematic. *Publications:* 1. Contributions from the Institute of Botany. 2. Flore Illustrée du Nord de la Chine. 3. Index Seminum, 1930, 1933. 1 and 2 are issued by the Institute of Botany, National Academy of Peiping. *Museum:* Open daily from 6 a.m. to 6 p.m. Admission, 10 cents. *Study collections* to loan to schools.

WUCHOW

"A Botanical Research Institute has been established in the University of Kwangsi, and the former British Consulate in Wuchow and the Riverside Park in which it is situated have been allotted to the new Institute. The Park will be remodeled into a Botanic Garden, and 6000-7000 mounted specimens have been transferred from the Botanical Institute of Sun Yatsen University to form a nucleus for the new herbarium." (Fide, *Chronica Botanica*, 1936, p. 101.)

Cochinchina (See **Indochina**)

Cuba

HAVANA (1)

EL JARDÍN BOTÁNICO DEL INSTITUTO DE SEGUNDA ENSEÑANZA DE
LA HABANA

Calzada de Carlos III

Established: 1901. *Area:* 4 hectares.

Director: Filipe Garcia Cañizares (1905–).

Open free on all "work days," 6–10 a.m., 2–5 p.m.

Note: Cañizares (El Jardín Botánico del Instituto de Segunda Enseñanza de la Habana. Habana, 1918, p. 11) states that the history of the Botanic Garden of the Institute is, in its beginning, intimately associated with that of the Jardín Botánico de la Universidad Nacional. The two represent the continuation of the garden that, under the auspices of the Patriotic Society of Friends of the Country was inaugurated May 30, 1817 on the site of the station of the Villanueva Railway, and which later, "by action of the Cuban Congress," was successively the site of the Presidential Palace and of the Capitol of Cuba.

HAVANA (2)

JARDÍN BOTÁNICO DE LA UNIVERSIDAD

Established: May 30, 1817.

Directors:

1. José Antonio de la Ossa (1817–1827)
2. Ramon de la Sagra (1827–1831)
3. Temporarily discontinued (1831–)
4. Pedro Alejandro Auber (acting) (1831–1843)

Note: The period 1864–1897 (called the "Second Epoch" of the Garden by its historian, Felipe Garcia Cañizares) was characterized by scientific and administrative disorganization. The period, 1897–1914, is called the "Third Epoch." During the academic year 1904–1905 a fence was erected separating the Jardin del Instituto de Segunda Enseñanza from the Jardin de la Universidad.

SOLEDAD

ATKINS INSTITUTION OF THE ARNOLD ARBORETUM, HARVARD
UNIVERSITY

Soledad, Cienfuegos, Cuba

Established: 1901. *Area:* About 300 acres.

Directors (Superintendents):

1. Robert M. Grey (1901–June, 1936)
2. David Sturrock (July, 1936–)

Note: Established under the name "Harvard Botanic Station for Tropical Research and Cane Sugar Investigation." The title has varied. In 1927 it was "Harvard Botanical Gardens, Soledad Estate, Cienfuegos, Cuba (Atkins Foundation)." The official one given above was adopted in 1932. The Administrator of Botanical Collections, Harvard University (address Arnold Arboretum, Jamaica Plain, Mass.), has general supervision over this Institution as one of the nine separately endowed botanical units of Harvard. About one half the 300 acres has been developed as a tropical botanic garden. The remaining part will be developed as funds become available. The land and its endowment were given by Mr. Edwin F. Atkins, who established the Soledad Sugar Estate. *Source of income:* Endowment (\$212,348.15) and gifts.

Laboratory space and equipment and living quarters are available for visiting scientists at Harvard House (Casa Harvard), constructed by Mr. Atkins. Those wishing to use the facilities should (1938) communicate with Dr. Thomas Barbour, custodian of the Atkins Institution, University Museum, Cambridge, Massachusetts.

Czechoslovakia (Č.S.R.)

BRNO (1)

BOTANIC GARDEN OF MASARYK UNIVERSITY

(BOTANICKÁ ZAHRADE MASARYKOVY UNIVERSITY)

Kounicova 63

Established: 1921.

Director: Jos. Podpěra (1921–?); August Bayer (1938).

Open free, daily, 7–12 a.m.; 2–7 p.m. Source of income: Governmental appropriations. *Library:* 983 volumes. *Herbarium:*

298,000 specimens. *Plantations*: Systematic, geographic. *Lectures* are given to school children at the Garden. *Study material* loaned to schools.

BRNO (2)

BOTANIC GARDEN OF THE AGRICULTURAL COLLEGE

(Vysoká Škola Zemědělská)

Cemá Pole 102

MOR. OSTRAVA (MORAVIAN OSTRAU)

BOTANIC GARDEN (BOTANICKÁ ZAHRADA)

OLOMOUC (OLMÜTZ)

BOTANIC GARDEN IN OLMÜTZ

(BOTANICKÁ ZAHRADA V OLOMOUCI)

Established: 1901. *Area*: 6000 square meters.

Directors:

- | | |
|------------------------------|----------------------------|
| 1. Leopold Frank (1901–1910) | 3. Anton Heske (1911–1919) |
| 2. Konrad Zelenka (1910) | 4. Josef Otruba (1919–) |

Serves as a public park. Open free daily at all hours. *Source of income*: "Annual appropriations by city, state, country, private subscriptions, membership dues." *Membership*: Honorary members: No payment. Founders: Kč 100. Contributors: Kč 5. *Library*: Reference only. About 540 volumes and 160 pamphlets. *Plantations*: Systematic, morphologic, ecologic, local flora, alpine plants, water plants, economic section, medicinal section. Special section for growing plants with which to supply schools. *Arboretum*: About 200 species. *Fruticetum*: About 100 species. *Species under glass*: About 500 pieces. *Plants out of doors*: About 3000 pieces. *Publications*: Ueber die Bedeutung und Einrichtung wissenschaftlicher Garten und die Anlage des botanischen Gartens in Olmütz. By Prof. Hugo Lanner. Seed List yearly. 1. Bericht der Naturwissenschaft. Sektion des Vereins Botanischer Garten in Olmütz, Olmütz 1905. 2. Bericht der Naturwissenschaft. Sektion des Vereins Botanischer Garten in Olmütz, Olmütz 1910. 3. Bericht der Naturwissenschaft. Sektion des Vereins Botanischer Garten in Olmütz, Olmütz 1913, enthaltend den "Führer durch den Botanischen Garten in Olmütz" (By Prof. Heinrich Laus and K. Zelenka.) *Study Collections*: Herbarium specimens and dried seeds are loaned to both public and private schools, and living material (not including wild plants) is supplied to local schools, both for botanical study and for classes in drawing.

PRAHA (PRAG) (1)

BOTANIC GARDENS OF THE CHARLES UNIVERSITY

(BOTANICKÁ ZAHRAHA KARLOVY UNIVERSITY)

Na Slupi 433, Praha II, Č.S.R.

Established: 1891. *Area*: 5 acres (2 hectares).*Directors*:

1. Josef Velenovský (1900–1927)
2. Karel Domin (1927–)

Open free daily to the public, 8 a.m.–6 p.m. *Source of income*: Governmental appropriations. *Library*: That of the Botanic Institute. *Herbarium*: Over 500,000 specimens. *Plantations*: Systematic, geographic, economic, medicinal, ecologic. *Publication*: Index Seminum (Seznam Semen). *Museum* (of the Botanic Institute) open free to the public, 8 a.m.–6 p.m. *Supplies living material* free to local schools.

PRAHA (PRAG) (2)

BOTANISCHER GARTEN DER DEUTSCHEN UNIVERSITÄT PRAG

Viničná 3a, Praha II, Č.S.R.

Established: 1892 (as continuation of an older garden).*Area*: About 15,000 square meters.*Directors* (of the new garden):

1. Richard Wettstein Ritter von Westersheim (1892–1899)
2. Günther Beck Ritter von Mannagetta und Lerchenau (1899–1920)
3. Fritz Knoll (1923–1933)
4. Adolf Pascher (1933–)

Open free daily, 7 a.m. to 7 p.m. *Source of income*: Governmental appropriations. *Library* (of the Botanical Institute): About 4500 volumes. *Herbarium*: About 500,000 specimens. *Plantations*: Systematic, geographic, economic, morphologic, ecologic, pharmaceutical, experimental. A small *Arboretum*. *Supplies living plant material* for study to schools.

PRŮHONICE

DENDROLOGICAL GARDEN

(DENDROLOGICKÁ ZAHRAHA V PRŮHONICÍCH)

Průhonice u Prahy (near Prag)

Director: Karel Domin (1937). *Index Seminum*.

ROUDNICE (RAUDPITZ)

BOTANIC GARDEN (BOTANICKÁ ZAHRADA). Seed List

TABOR

HORTUS BOTANICUS (BOTANICKÁ ZAHRADA)

Zemská Višši Škola Hospodářská, Tabor, Č.S.R.

Director: Prof. Adolf Kutin (1938). Delectus Seminum.

Denmark

CHARLOTTENLUND (North of Copenhagen)

HORTUS DENDROLOGICUS (ARBORETUM)

See also Copenhagen (1).

COPENHAGEN (1)

UNIVERSITETS BOTANISKE HAVE, KØBENHAVN

Established: 1871–74. *Area:* About 25 acres.*Directors:*

1. Christen Friis Rottböll (1778–1797)
2. Erik Nissen Viborg (1797–1801)
3. Martin Vahl (1801–1804)
4. Jens Wilken Hornemann (1804–1841)
5. Joakim Frederik Schouw (1841–1852)
6. Frederik Michael Liebmann (1852–1856)
7. Johan Lange (1856–1876)
8. Didrik Ferdinand Didrichsen (1876–1885)
9. Johannes Eugenius Bülow Warming (1885–1911)
10. Christen Raunkiär (Nov. 1, 1911–Aug. 8, 1923)
11. Carl Hansen Ostenfeld (Sept. 1, 1923–Jan. 16, 1931)
12. Knud Jessen (July 1, 1931–)

Serves as a public park. Open free, daily, 1 p.m. to sunset; to students throughout the day. *Source of income:* As an institution of the University of Copenhagen the garden has an annual appropriation by national government. *Library:* More than 20,000 volumes and pamphlets. *Herbarium:* More than 400,000 specimens, not counting Cryptogams. *Arboretum:* About 650 species. *Fru-ticetum:* About 1200 species. *Plantations:* Systematic, Ecologic,

Local Flora, Rock Garden. *Arboretum and Fruticetum* systematic; Local flora partly systematic, partly ecologic. Herbaceous plants systematic. *Publications*: *Arbejder fra den botaniske Have i København*; *Fører i Botanisk Have* (Guide for the Botanic Garden). Index Seminum includes also seeds collected in the Botanic Garden of the Agricultural College of Denmark, in the Arboretum at Charlottenlund, and the Garden of Dr. F. Börgesen, at Hellebaek. *Museum* is open to students and botanists only, from 12 to 4 p.m. *Living material* for study and seeds are furnished when requested to every school in Denmark. For many years the average distribution reached 10,000–14,000 samples per year. *Note*: The first garden was started in 1600 near the University. The second was laid out by the botanist Oeder. The third, and present, was laid out in 1871–74 on the site of the old fortifications of the City—i.e., on the outskirts, near Charlottenborg. It now lies in the center of the City, so greatly has the City grown.

COPENHAGEN (2)

BOTANIC GARDEN OF THE AGRICULTURAL COLLEGE

See also Copenhagen (1)

GODHAVN (Island of Disko)

(BOTANIC GARDEN)

Den Dansk Arktiske Station Paa Disko N. 12, København, Denmark

Established and endowed, 1906 by A. Holck as Den Danske Arktiske Station Paa Disko. (On the island of Disko off the west coast of Greenland, Latitude 69°15'. The station has been taken over by the Danish government.)

Director: Morten Pedersen Porsild (1906–).

Cultivates some of the plants of the Arctic regions, and is open to visiting investigators. Not really a botanic garden.

Dutch East Indies

See Netherlands East Indies

England

See Great Britain

Estonia

TARTU (JURJEV, DORPAT)
 BOTANIC GARDEN OF THE UNIVERSITY
 (TARTU ÜLIKOOI BOTAANIKAAED)

Established: 1803. *Area:* 3.27 hectares.

Directors:

1. G. A. German (1803–1809)
2. C. F. Ledebour (1811–1835)
3. A. Bunge (1836–1867)
4. M. Willkomm (1868–1874)
5. E. Russow (1874–1895)
6. N. J. Kusnetzow (1896–1916)
7. F. Bucholtz (1919–1923)
8. E. Spohr (1924–1930)
9. T. Lippmaa (1930–)

Open daily. Summer, 9 a.m. to 12 noon; 2 to 6 p.m. Winter, the greenhouses only, Sunday and Wednesday, 12 noon to 2 p.m. *Admission*, 10 eston. cents. *Source of income:* Governmental appropriations. *Library:* 3940 volumes, 3957 pamphlets. *Herbarium:* 146,700 specimens. *Plantations:* Morphologic-biologic, systematic, geographic (Estonian, Subarctic, Alpine, Caucasian, Siberian, East Asiatic, North American). *Arboretum* and *Fruticetum* of 2471 species. *Publications:* Acta Instituti et Horti Botanici Universitatis Tartuensis; Index Seminum. *Museum:* Small, for students.

Federated Malay States**KUALA LUMPUR****PUBLIC GARDENS**

Kuala Lumpur, Selangor, Federated Malay States

Though often referred to as a "botanic garden," the Director of Agriculture, as Chairman of the Gardens, states that it is a pleasure garden, and not a scientific institution.

Finland

BORGA

BOTANIC GARDEN

HELSINKI (HELSINGFORS)

HELSINGIN YLIOPISTON KASVITIETEELLINEN PUUTARHA
(BOTANICAL GARDEN OF THE UNIVERSITY OF HELSINKI)

Unioninkatu 44

Established: 1828. *Area:* 5.3 hectares.

Directors:

1. Carl Reinhold Sahlberg (1828–1840)
2. Johannes Magnus von Tengström (1840–1849)
3. Alexander von Nordmann (1849–1857)
4. Wilhelm Nylander (1857–1863)
5. Alexander von Nordmann (1863–1865)
6. Sextus Otto Lindberg (1865–1889)
7. Johan Peter Norrlin (1889–1892)
8. Fredrik Emil Volmar Elfving (1892–1926)
9. Kaarlo Linkola (1926–)

Serves as a public park. Open free, daily, during daylight.
Sources of income: Annual appropriations by the state. *Plantations:* Systematic, economic, ecologic, arboretum, fruticetum. *Study material* (flowers, leaves, and cultivated phanerogamic plants) is supplied to both public and private schools occasionally when requested. *Note:* In the Garden is also the Botanical Museum and the Botanical Laboratory of the University, quite independent from the Garden, but with the same director. They are not open to the public. In connection with them there is a library.

TURKU (ABO)

TURKU YLIOPISTON KASVITIETEELLINEN PUUTARHA
(THE BOTANIC GARDEN OF THE UNIVERSITY OF TURKU)

Established: 1924. *Area:* 2 hectares.

Directors: 1. Kaarlo Linkola (1924–1925); 2. H. I. Waris (Warén) (1925–).

Serves as a public park. Open free, daily, 9 a.m.–8 p.m.
Source of income: Budget of the University. *Library and Her-*

barium are those of the University. *Arboretum*: Small. *Fruticetum*: Small. *Plantations*: Systematic, economic, rock garden. *Lectures* are given to school children at the Garden. *Study material* loaned to schools.

France

ALFORT (SUBURB SOUTHEAST OF PARIS) (1)

JARDIN BOTANIQUE

According to Loudon (*Encycl. Gard. Loudon*, 1865, p. 102) this Garden, in 1865, contained "the remains of what has been a tolerably complete arboretum," including an extensive collection of hedge plants and hedges, "a grass ground containing patches of several yards square of all the principal grasses [a "Graminetum"], including the cultivated corns," and other economic plants. "Close to the college . . . is [1865] a small systematic botanic garden, representing, perhaps, fifty of the Jussieuean orders."

ALFORT (SEINE) (2)

JARDIN BOTANIQUE DE L'ÉCOLE VÉTÉRINAIRE

Director: H. Simmonet. Under the Ministry of Agriculture.

ANGERS (MAINE-ET-LOIRE)

JARDIN DES PLANTES

Butte du Pélican et Rue Boreau

ARBORETUM DE LA MAULÉVRIE

Route des Ponts de Cé

ANTIBES (ALPES-MARITIMES)

VILLA THURET

Route du Cap d'Antibes

Established: 1858. *Area*: 5.5 hectares.

Directors:

1. Gustave Adolphe Thuret (1858–1875)
2. Edouard Bornet (1875–1878)
3. Charles Naudin (1878–1899)
4. Georges Poirault (1899–1936)
5. Marc Simonet (1936–)

Serves as a public park. Open daily, 9–12 and 2–6. Admission 2 francs. *Source of Income:* Ministère de l'Agriculture. *Library:* 3500 volumes. *Herbarium:* 600 cartons. *Arboretum* of 3.5 hectares. *Classes from schools* of the Department visit the Garden by appointment. *Affiliation:* "Numerous relations with the University and Natural History Museum of Paris."

AURILLAC (CANTAL)

JARDIN BOTANIQUE DE L'ÉCOLE NORMALE D'AURILLAC

22 rue Jules Ferry

Established: Abandoned during the World War, but re-established January 1, 1935. *Area:* 30 acres.

Director: Georges Aufrère (Jan. 1, 1935–).

Source of income: Small subvention from the Département du Cantal, to which the property belongs. *Herbarium:* About 3000 specimens. *Plantation:* Systematic. *Publication:* Carte botanique du Cantal; La Prairie d'Auvergne. *Affiliation:* Académie de Clermont Ferrand. *Note:* This garden is devoted exclusively to alpine plants.

BAGNÈRES DE BIGORRE (HAUTES PYRÉNÉES)

JARDIN ALPIN ET LABORATOIRE BOTANIQUE

Director: J. Bouget (1937).

BELFORT (ALSACE)

JARDIN ALPIN DU BALLON D'ALSACE

5 Avenue de la Gare, Belfort

(Discontinued, 1936? Mail not delivered)

Established: 1887. *Area:* 120 square meters.

Director: C. Brunotte (1902); Dubail-Roy (1912).

Source of income: Maintained by the committee of the Belfort section of the Club Alpin Français. *Plantations* devoted to Alpine plants.

BESANÇON (DOUBS) (1)

JARDIN BOTANIQUE DE L'UNIVERSITÉ DE BESANÇON

Rue Girod de Chantrans

Established: 1890.

Directors: Antoine Magnin (1890–1919); P. Eberhardt (?).

BIÈVRE (SEINE-ET-OISE)

JARDIN ALPIN

Director: Société National d'Acclimation, and the local Museum.

BLOIS (LOIR-ET-CHER)

JARDIN BOTANIQUE ROYAL

Curator: Robert Morison, about 1651. Discontinued.

BORDEAUX (GIRONDE) (1)

JARDIN BOTANIQUE DE LA FACULTÉ DE MÉDECINE
ET DE PHARMACIE

356 Cours Gambetta, Talence (près Bordeaux)

Director: J. Golse (1937). *Publication:* Graines Récoltées.

BORDEAUX (GIRONDE) (2)

JARDIN BOTANIQUE DE LA VILLE DE BORDEAUX

Director:

L. Beille (1936)

Herbarium: Specially rich in flora of the southwest of France.
Library: About 4000 vols. *Publication:* Liste des Graines.

CAEN (CALVADOS)

JARDIN BOTANIQUE DE LA VILLE DE CAEN

Established: 1736. *Area:* 5 hectares.

Directors:

1. Marescot (1736–1747)
2. Sébastien Blot (1747–1758)
3. Goubin et Desmoueux (1758–1759)
4. Desmoueux (1759–1786)
5. de Roussel (1786–1797)
6. Desmoueux, returned (1797–1801)
7. de Roussel, returned (1801–1812)
8. Jean Vincent Felix Lamouroux (1812–1825)
9. Eudes Deslongchamps (1825–1839)
10. François Joseph Chauvin (1839–1859)

11. Pierre-Gilles Morière (1859–1871)
12. Eugène Vieillard (1871–1895)
13. Octave Lignier (1896–1916)
14. Clodimir Houard (1916–1919)
15. René Viguiier (1919–1931)
16. Pierre Choux (1932–1936)
17. Fernand Moreau (1936–)

This is a municipal garden, although the Botanical Institute, and the School and Museum of Botany are affiliated with the University, and are conducted under the exclusive direction of the Professor of botany of the Faculty of Sciences and the Keeper (Conservateur). All the plants of the Garden are at the service of the investigators in the Botanical Institute.

The Garden was founded in 1736 by Marescot, Professor in the University of Normandy, and belonged to that University until 1791. From 1791 to 1803 it was administered by the Department of Calvados. On the latter date it was given to the city. In 1829 it was considerably enlarged. The large conservatory was built in 1850, and rebuilt and enlarged in 1894 and 1901. The Botanical Institute began in 1891.

Serves as a public park. Open free daily. *Library:* 6000 volumes and numerous periodicals (in the Botanical Institute of the Faculty of Sciences). *Herbarium:* Several important herbaria, one of them (Herbier Le Normand) includes more than 1000 books and 60,000 species. *Plantations:* Systematic. *Publication:* Catalogue des Graines Récoltées.

Note: The faculty of medicine was established in 1448, but it was not until about 1688 that Prof. Callard de la Ducquerie purchased a garden which he filled with plants for use in teaching. Later the University provided modest funds for maintenance of the Garden. The garden called, "*Hortus botanicus agri Codo-mensis*," contained 559 species, arranged according to their medicinal properties. Marescot succeeded Callard in 1718 (*fide* personal letter from René Viguiier). Thanks to the devotion of Maréchal de Coigny, additional land was acquired in 1734 and actually occupied in 1736.

CHAMROUSSE (ISÈRE)

JARDIN ALPIN DE CHAMROUSSE

Discontinued

Established: 1893, at a place called Roche-Béranger, altitude 1850 meters, by the Société des Touristes du Dauphiné. La Société Horticole dauphinoise also gave moral and financial support. In 1898 the Société des Touristes ceded the Garden to the Faculty of Grenoble.

Director: P. Lachmann (1899–1908); Marcel Mirande (1908–).

CLERMONT-FERRAND (PUY-DE-DÔME)

JARDIN BOTANIQUE DE L'ÉCOLE NORMALE DES INSTITUTEURS

DIJON (CÔTE-D'OR)

JARDIN BOTANIQUE DE LA VILLE DE DIJON

Avenue Albert 1^{er}

Established: (1772) 1833. *Area:* About 4 hectares.

Directors:

- | | |
|----------------------------|----------------------------|
| 1. Pierre Fleurot (1833–?) | 3. Alphonse Lagrasse (?–?) |
| 2. M. Lavalle (?–?) | 4. Paul A. Genty (1898–) |

Serves as a public park. Open free daily. *Source of income:* Municipal appropriations. *Library:* About 3000 books and pamphlets. *Herbarium:* About 50,000 specimens. *Arboretum* and *Fruticetum* combined. *Plantations:* Herbaceous plants systematic, after De Candolle's "Prodromus." *Publication:* Catalogue annuel des graines récoltées et offertes en échange. The Director, during spring, conducts free public "Herborizations" (field trips). Study material is supplied to students in the University of Dijon, the Lycées, and schools.

DOUAI (NORD)

JARDIN BOTANIQUE DE LA SOCIÉTÉ NATIONALE D'AGRICULTURE,
SCIENCES, ET ARTS

Rue d'Arras 8 bis

ÉCULLY (RHÔNE)

JARDIN BOTANIQUE ET D'ESSAIS

Affiliated with L'École d'Agriculture Pratique du Rhône

EVREUX (EURE)

JARDIN BOTANIQUE

GRENOBLE (ISÈRE) (1)

JARDIN DES PLANTES DE GRENOBLE

Established: 1845(?). *Area:* About 10 acres.*Directors:* 1. J.-B. Verlot (1845–1886); 2. Joseph Allemand (1886–1921); 3. G. Seguin (1922–).*Publication:* Seed List.

GRENOBLE (ISÈRE) (2)

JARDIN DE L'INSTITUT BOTANIQUE ALPIN DU LAUTARET
(HAUTES-ALPES)

Prof. R. de Litardière, L'Université de Grenoble

Established: 1919. *Area:* 10,000 square meters. *Altitude:* 2150 meters.*Directors:* Marcel Mirande (1919–1930); R. de Litardière (1930–).

Serves as a public park, open free to the public. *Source of income:* City of Grenoble. *Herbarium:* Devoted to the plants of the western Alps. *Plantations:* Systematic, geographic. The garden is divided into the following sections: 1. A large area, scattered with rocks, simulating a small valley, traversed by a rivulet which empties into a small pond. This section is devoted specially to the flora of the Lautaret. 2. A large area, comprising the systematic collection, is devoted to the flora of the western Alps in general. 3. All the rest of the garden is divided into 8 regions, each built up of a collection of rocks, and devoted, respectively, to the following botanical regions: 1. Jura (calcareous rocks), 2. Pyrenees, 3. Mountains of the Mediterranean region, 4. Caucasus and Ural, 5. Eastern Alps and Carpathians, 6. Himalaya, Tibet, Altai, Siberia, 7. Arctic regions, 8. Miscellaneous mountain regions.

Publication. Seed list.

This Garden has replaced the former Garden of Lautaret, established by P. Lachmann in 1899 (page 200), now discontinued.

GRIGNON (SEINE-ET-OISE)

JARDIN BOTANIQUE DE L'ÉCOLE NATIONALE D'AGRICULTURE DE
GRIGNON

Established: 1873. *Area:* 2 hectares.

Directors:

1. Émile Victor Mussat (1873–1902)
2. Edouard Griffon (1902–1912)
3. Fernand Pierre Guéguen (1912–1915)
4. Vital Ducomet (1915–1931) et G. Viennot Bourgin (1926–1931)
5. A. L. Guyot (1932–) et G. Viennot Bourgin (1932–)

Open to visitors daily, 8–11 a.m. and 1–6 p.m. *Source of income:* Governmental appropriations through the Minister of Agriculture. *Library:* 15,000 volumes. 20 current periodicals received. *Herbarium:* 30,000 specimens. *Arboretum* and *Fruticetum:* Both together comprise 2200 species. *Plantations:* Systematic. *Species under glass:* "Several thousand." *Publication:* *Annales de Grignon*.

LA ROCHELLE (CHARENTE-INFÉRIEURE)

JARDIN BOTANIQUE DÉPARTEMENTAL DE LA CHARENTE-
INFÉRIEURE (*Discontinued*)

Established: 1871. *Area:* one-half hectare.

Directors: 1. Edouard Beltzemieux (1871–1894); 2. J. Foucaud (1894–1906).

Served as a public park; open free, daily from 8 a.m. to 6 p.m.

Note: The president of the Society of Natural Sciences of the Charente Inférieure reports that the Botanic Garden of La Rochelle was discontinued after the death of the last director in 1906, and transformed to an ordinary public garden belonging to the city and maintained by it.

LAUTARET (HAUTES-ALPES)

JARDIN ALPIN

L'Université de Grenoble

Discontinued: See Grenoble (Isère) (2)

Established: 1896. *Area:* 3000 sq. meters. *Altitude:* 2075 meters. *Director (and Founder):* Paul Lachmann (1899–1908); Marcel Mirande (1908–?). See bottom of page 199.

Directors: 1. P. Lachmann (1896–1908); 2. Marcel Mirande (1908–1919).

The Ministry of Works having declined to finance the Garden, M. Bonnabel, proprietor of the local hotel provided the funds for its grading and terracing (1896–1897), and the planting was done in 1899. The most noteworthy feature was a collection of 532 species characteristic of the flora of the western Alps. In 1908 the Garden contained typical representatives of the principal mountain massives of the world.

LAVOINE (ALLIER)

JARDIN BOTANIQUE

LE PUY (HAUTE-LOIRE)

JARDIN BOTANIQUE DE L'ÉCOLE NORMALE DES INSTITUTEURS

LEVALLOIS-PERRET (SEINE)

MUSÉE ET JARDIN BOTANIQUE

Rue Lannois 37 Bis

LILLE (NORD)

JARDIN BOTANIQUE DE L'UNIVERSITÉ CATHOLIQUE

Rue du Port

LEZOUX (PUY-DE-DÔME)

JARDIN ET HERBIER CLASSAGNE

Willow Garden. About 10,000 living species, hybrids, and forms.

LYON (RHÔNE) (1)

JARDIN BOTANIQUE À CHÂTILLON-LES-DOBES

Established: 1758, by Philibert Commerson. Discontinued.

Note: Antoine Magnin (*Prodrome d'une Histoire des Botanistes Lyonnais*. Mém. Soc. Bot. de Lyon 31–32: 1–140; 1–39. 1906) says that the remnants of this Garden were still at Lyons in 1832.

LYON (RHÔNE) (2)

JARDIN BOTANIQUE DE L'ÉCOLE VÉTÉRINAIRE

Established: 1763, by La Tournette at the Guillotière.

Directors:

1. L'Abbé François Rozier (1765–1766)
2. Jean-Baptiste-Antoine Rest-Maupas (?)
3. Jacques-Marie Hénon (1780–1809)

Plantations: Systematic after Tournefort. *Note:* Transferred in November 1796 to the Claustral des Deux-Amants, quai Pierre-Seize. Enlarged in 1802 by the neighboring Claustral des Cordeliers de l'Observance.

LYON (RHÔNE) (3)

JARDIN BOTANIQUE DU PARC DE LA TÊTE D'OR

Established: 1773. *Area:* The Park, 114 hectares; the Garden, 13 hectares.

Note: This garden was successively located (1) at Brotteaux near the Loge de la Parfaite-Harmonie (1773–1774), but was not completed there; (2) Clos de la Déserte, below la place Sathonay (1795–1857); (3) Parc de la Tête d'Or since 1857. (For further data on its organization consult *Soc. Bot. Fr.* 1876 session. Pages c and ci.) The Garden was devastated by a terrible hurricane on August 4, 1853.

Directors:

1. Jean-Emmanuel Gilibert (1795–1799, 1804–1808). Founder of the Garden at the Clos de la Déserte.
2. Gaetano Nicodémi or Nicodémo (Dec. 27, 1799–1804)
3. Gaspard Dejean, or de Jean de Saint-Marcel (March 21, 1808–1819)
4. Jean-Baptiste Balbis (1819–August 20, 1830)
5. Louis-Henry Latil de Thimécourt (July 26–August 18, 1830). Roffavier (August 19–21, 1830). Three days, only, in office. The Preface of the *Flora* of Balbis is signed "Roffavier"
6. Nicolas-Charles Seringe (August 24, 1830–September 29, 1858)
7. Gustave Bonnet (Director-General of the Parc de la Tête-d'Or, including the Jardin Botanique), (December 1858–1870)

8. Jean-Joseph-Augustin-Ernest Faivre (Actual successor of Seringe as Director of the Jardin Botanique (March 27, 1871–June 24, 1879). First Director at la Tête-d'Or.
9. Louis Cusin, Assistant naturalist, was placed in temporary charge of various activities of the Garden, June 30, 1879–March 15, 1880. He continued as assistant naturalist from November 6, 1857 until October 1, 1884.
10. Gustave Dutailly (March 15, 1880–April 5, 1880). He began the Arboretum, the Conservatories, and the labeling of the botanical collections of the City.
11. Antoine Magnin (November 21, 1881–April 30, 1884)
12. Léon Guignard (April 30, 1884–March 1, 1887)
13. René Gérard (March 1, 1887–1926)
14. Louis Faucheron (1926–1937)
15. Robert Douin (1937–)

Open free, daily, from 9 a.m. to 6 p.m. *Source of income*: Annual appropriation by the city. *Library*: Reference. 4500 volumes. *Herbarium*: 1140 cartons of plants. *Plantations*: Systematic (after Bentham and Hooker); *Arboretum*, *Fruticetum* (about 1000 species), a small section of medical plants, and one of horticultural perennials and annuals. *Under glass*: 7000 square meters. *Herbaceous plants* out of doors: 4211 species. *Publication*: Index Fructuum et Seminum. *Museum*: Rudimentary. The garden supplies art schools regularly with living material. *Affiliations*: The University, the Veterinary school, and l'École des Beaux-Arts. The director of the Garden is Professor of Botany in the University. *Note*: Le Jardin Botanique et Service des Cultures de la Ville de Lyon is situated in the Parc de la Tête d'Or, which contains also a zoological collection, a pharmaceutical garden, and a conservatory which has been described as "the finest greenhouses in France," containing "a unique collection" of orchids, palms, and cycads.

MALMAISON (SUBURB NORTHWEST OF PARIS)

JARDIN BOTANIQUE

Loudon * states that, at the time of Josephine (about 1813), this garden "was among the richest in Europe. Various botanical collectors were patronised. . . . The seeds brought home by the navigator Baudin were here first raised, and described by Ventenat

* Encyclopaedia of Gardening. New Ed. London. 1865. p. 101.

in the *Jardin de la Malmaison*, in 1803. . . . In 1813 Bonpland published the first volume of *Plantes rares cultivées à Malmaison et à Navarre*."

MARSEILLES (BOUCHES-DU-RHÔNE) (1)

JARDIN BOTANIQUE DE LA VILLE DE MARSEILLES

Parc Borély

Established: 1880. *Area*: 1 hectare.

Directors: 1. Edouard Heckel, Founder (1890–1897); 2. Henri Jumelle (1897–1935; 3. Élie Decrock (1936–).

Serves as a public park, open daily at all hours. *Source of income*: Municipal appropriations. *Library*: Reference. 700 volumes. 200 pamphlets. *Herbarium*: 10,000 specimens, in the general herbarium, and "the herbaria left by deceased botanists." *Plantations*: Systematic. Arboretum (300 species well labelled) in the Parc Borély (50 acres), which surrounds the Garden. *Species under glass*: 2500. *Herbaceous plants* out of doors, 1,850. *Publication*: Catalogue des graines, récoltées au Jardin. *Study material* is supplied to the Faculty of Science and to the Colonial Museum of the University, with which the Garden is affiliated.

MARSEILLES (BOUCHES-DU-RHÔNE) (2)

JARDIN BOTANIQUE DE LA FACULTÉ DES SCIENCES

MARSEILLES (BOUCHES-DU-RHÔNE) (3)

JARDIN BOTANIQUE DE LA FACULTÉ DE MÉDECINE ET DE
PHARMACIE

92 Rue A. Blanqui

Director: Cyprien Gabriel (1936). Liste des Graines.

METZ (MOSELLE)

JARDIN BOTANIQUE

Director: C. H. Navel (1935). Catalogue des Graines.

MONT DORÉ (PUY-DE-DÔME)

MUSÉE ET JARDIN BOTANIQUE ET D'ESSAIS

MONTPELLIER (HÉRAULT)

JARDIN DES PLANTES DE L'UNIVERSITÉ DE MONTPELLIER

Boulevard Henry IV

Established: 1593. *Area:* 5 hectares.*Director:* Prof. Galavielle (1928), Faculté de Médecine.

Open daily, 7 a.m. to 7 p.m. *Source of income:* Governmental appropriations. *Library:* Numerous works and publications. *Herbaria:* "18 different herbaria." *Plantations:* Systematic, according to de Candolle. *Museum:* Open from 8 a.m. to 6 p.m. Admission by permit from the Director. *Affiliation:* With the University of Montpellier and is attached to the Chair of Botany of the Faculty of Medicine.

NANCY (MEURTHE-ET-MOSELLE)

JARDIN BOTANIQUE DE LA VILLE DE NANCY

30 bis Rue Ste. Catherine

Established: 1758. *Area:* 1½ hectares.*Directors:*

- | | |
|-----------------------------------|----------------------------|
| 1. Dominique Alexandre | 3. Edmond Gain (1913–1937) |
| Godron (1854–1872) | 4. R. Cerighelli (1938–) |
| 2. Georges Le Monnier (1872–1912) | |

Serves as a public park. Open daily, except mornings on Sundays and holidays. *Source of income:* Municipal appropriations. *Herbarium:* 800 cartons at the Institut Botanique. *Plantations:* Systematic (2500 species). Morphologic and ecologic sections are being organized. *Publication:* Catalogue annuel des semences récoltées. *Lectures to school children* are given at the Gardens. *Study material* is loaned to schools. *Affiliation:* Institut Botanique de la Faculté des Sciences de Nancy.

NANTES (LOIRE INFÉRIEURE) (1)

LE JARDIN DES APOTHECAIRES

Established: 1687–1688. In the archives of the City of Nantes there is a "Mémoire pour le Jardin Royal et Botanique de Nantes, créé de 1687–1688 (Archives Municipales de Nantes, supt.-D.D. 339.)

Promenades Publiques: Jardin des Apothecaires. This was the ancestor of the present Garden. The letters patent were signed by Louis XIV, February, 1688. This Garden existed

for 186 years in the same place. In 1807 the Garden came under the direction of the Société des Pharmaciens. In 1806 the first Jardin Botanique Municipal was established by Hectot. In 1840 the Library was established, and in 1844 the plantations were arranged according to the system of Jussieu.

Old documents have been found in the Archives of Nantes proving that the City was proprietor of an ancient Apothecaries Garden as early as 1473.

Directors:

First Garden

Le sieur Cigogne (Maitre Apothicaire) (1687–?)
Lefebvre de Ferrière
Duplessis Richard

Under the Revolution

Second (present) Garden

Le Citoyen Hectot (1810–1836). In 1806 he created the nucleus for the present Jardin des Plantes. He qualified as director March 13, 1810.

Under the Municipal Regime (from August, 1820):
See Nantes (2)

NANTES (LOIRE INFÉRIEURE) (2)

JARDIN DES PLANTES DE NANTES

Rue Stanislas Baudry

Established: The present Garden, 1858. (See Nantes (1))

Area: 7 hectares, 15 ares, 60 centares.

Directors:

1. Dr. Écorchard (Professor 1836. Director 1840–1882. He died December 17, 1882).

In April, 1853, the Garden was closed and renovated and again opened to the public. From 1882–1893, there was no director. The Head Gardener, M. Rochay, was in charge.

2. Paul Marmy (April 28, 1893–1897)

3. Théophile Pierre Pellerin (December 20, 1897–1899)

4. Dr. Citerne (November 10, 1899–1908)

In 1909 a bill did away with the scientific directorship, and M. Etienne Contan, an architect, was the head with title of “Directeur des Services d’Architecture et des Plantations.”

5. Georges P. L. Durivault, "Jardinier en Chef de la Ville" (1921–1935). Conservateur du Jardin des Plantes, Parcs, et Promenade (Dec. 31, 1935–).

Serves as a public park. Open free, daily in summer, 6 a.m.–8:30 p.m.; in winter, 7 a.m.–to sunset. The greenhouses are open to the public twice a week and at the time of flower shows. *Source of income:* Municipal Budget. *Library:* More than 500 volumes, plus the library of the Director (1000 volumes). *Herbarium:* Local Flora: 1800 species (total 2368 specimens). *Arboretum:* 361 species. *Fruticetum:* 300 shrubs. They are classified systematically (De Candolle system). *Publication:* Seed List. *Museum:* Small collection of wax fruits, herbaria of Dr. Écorchard and of a local nurseryman. Open free.

NOGENT-SUR-VERNISSON (LOIRET)

ARBORETUM DES BARRES ET FRUTICETUM VILMORINIANUM

Established: 1866 (Arboretum), 1894 (Fruticetum). *Area:* 170 acres.

This institution is said to have the most complete collection of trees and shrubs in France.

ORLÉANS (LOIRET)

JARDIN DES PLANTES

Established: 1640, by the Société des Apothicaires on the site of the fortifications of Saint-Laurent. It was flourishing in 1680. Subsequently the physicians and surgeons of Orléans established another garden on the Rue du Four-à-Chaux. In 1720 Lambert de Cambray described a large number of plants of the environs of Orléans; his manuscript is still in the library of the Garden.

In 1760 the "Jardin botanique des Apothécaires," which had been neglected, was renovated and greenhouses were built. In 1781 after the foundation of the "Académie des Sciences physiques et naturelles" at Orléans, the botanic garden was placed under the direction of the Academy, which held its meetings at the Garden. At this time the "principal director was Couret de Villeneuve (b. at Orléans, 29 June, 1749, d. at Gent, 20 January, 1806). He left Orléans about 1800 or 1801 to become director of the Garden at Gent, Belgium (*q.v.*). His "collaborator" was

Prozet, a pharmacist of Orléans. During the Revolution (in 1793) the garden and conservatories were transformed into clubs. Subsequently (date not determined) the Abbé François-Noël-Alexandre Dubois (b. 1752; d. 1824) became demonstrator at the Garden.

In 1806 the Garden became the property of the City, under a head gardener named Gaucherot. Director 1808–1826, a “gardener-botanist,” named Gaillard (from Paris). Auguste de Saint-Hilaire became a member of the Société des Sciences of Orléans, but his relation to the Botanic Garden is not known. From 1816 the Garden was for some time under a board of “Conservators” appointed by the mayor. From 1826–1831, and later, a course of instruction in botany was given by Pelletier. In 1835 the Garden was moved to a new site of 3 hectares, 41 ares, 40 centiares, at the junction of the Route de Saint-Mesmin and the Rue Guignegault, where it still was in 1873. In 1847 Al. Jullien-Crosnier, a botanist, was made Conservator. He completed the nursery and conservatories. From 1866 the Garden was administered by a commission of five members appointed by the City Council. (Above based on Rossignol-Louis. *Notice Historique sur le Jardin des Plantes d'Orleans*. Orléans, 1874. No reply to our questionnaire.)

PARIS (1)

MUSÉUM NATIONAL D'HISTOIRE NATURELLE

(JARDIN DES PLANTES)

57 Rue Cuvier, Paris (V^e)

Established: 1635 (See Note 1). *Area:* 30 hectares.

Note 1: In 1597, or earlier, Jean Robin had a garden of medicinal plants of his own at Paris, containing 1300 plants of which he published a catalogue in 1601. His son, Vespasien, published a new catalogue in 1624, listing more than 1800 plants. In January, 1626, Louis XIII (by letters patent registered at Parlement July 6, 1626), at the solicitation of “le sieur Hérouard,” his chief physician, and Guy de la Brosse, his physician in ordinary, authorized the establishment of “un Jardin royal” in one of the *faubourgs* of Paris, “to contain all kinds of medicinal herbs . . . for the instruction of the students of the University of Medicine.” An

edict of 1635 confirmed the purchase of the site (Le clos Coyneau) and the appointments of Bouvard (successor to Hérouard (Hérouard) d. 1628) and Guy de la Brosse. Opened to the public in 1640, it was generally called "Jardin du Roy," but over the entrance at 38, rue Geoffroy-Saint-Hilaire was inscribed, "Jardin Royal des Herbes Médicinales." The tercentenary of the edict of 1635 was celebrated by the Muséum in 1935. (*Archives du Mus. Nat. d'Hist. Nat. Volume du Tricentenaire. Sixième Série. Tome Douzième. Paris. 1935.*) The "Jardin du Roy," as such, terminated with the administration of Bernardin de Saint-Pierre (1793). "The National Museum of Natural History, known under the popular name of Jardin des Plantes, is an Institution of Higher Education comprising nineteen chairs for instruction in the natural sciences."

Note 2: During the Consulate (1799–1804) André Thouin organized the scientific and educational work of this Garden to include the collecting of plants of economic interest, propagating them, and distributing them to the botanic gardens of all the Departments of France. There was then a botanic garden in the capital city of each Department. So far as the supply lasted, plants and seeds were sent next to gardens in French colonies, and then to foreign countries. The gardens were enlarged and improved in 1840.

Administration (1626–1793): The following two paragraphs are the data supplied by the Muséum National d'Histoire Naturelle in their questionnaire returned July, 1938:

Superintendants du Jardin du Roy: 1. Jean Hérouard (1626–1627); Charles Bouvard (1627–1646); 3. François Vautier (1646–1652); 4. Antoine Vallot (1652–1671); "Employ supprimé" (1671–1699); 5. Guy-Crescent Fagon (1699–1718); 6. Poirier (1718).

Intendants du Jardin du Roy: 1. Guy de la Brosse (1626–1641); 2. Mich. Bouvard de Fourcreux (1641–1646); 3. W. Dawisson (1646–1651); "Employ supprimé" (1651–1672); 4. Pierre D'Aquin (1672–1673); 5. Guy-Crescent Fagon (1673–1718); 6. Pierre Chirac (1718–1732); 7. De Cisternay du Faÿ (1732–1739); 8. Georges-Louis de Buffon (1739–1788); 9. Fla-

hault de la Billarderie (1788–Jan. 1, 1792); 10. Bernardin de Saint-Pierre (July 1, 1792–1793). From 1793 to 1863 directors were appointed for one year. Beginning with 1863, directors were elected for five years, and were eligible for re-election.

Directors:

1. Michel Eugène Chevreul (1863–1879)
2. Edmond Frémy (1879–1891)
3. Alphonse Milne-Edwards (1891–1900)
4. Edmond Perrier (1900–1919)
5. Louis Mangin (1920–1931)
6. Paul Lemoine (1931–1936)
7. Louis Germain (1936–)

Serves as a public park. Open free daily, but admission is charged to the menagerie, galleries, vivarium, museum of the Duc d'Orléans, Musée Pompon and conservatories. *Source of income:* Governmental appropriations (about one tenth) and above mentioned admission fees. *Plantations:* Systematic (Bentham and Hooker—Cf. Index of Durand). About 11,000 species of herbaceous plants (Guide Book, 1922). *Arboretum* (Jardin de Jussieu): Occupies the domain of Chèvreloup, near Versailles, acquired December 28, 1927; 40 hectares, 5000 species. *Herbarium:* 30,000 bundles, each containing 50 to 100 specimens ("le plus riche du monde"). Includes the collections of A.-L. de Jussieu, of his son Adrien, and of Auguste de Saint Hilaire. *Library:* The botanical library is comprised in the general library of the Museum, which has 300,000 volumes, 50,000 pamphlets, 4000 current periodicals (botany and other sciences). *Laboratories* (phanerogams, cryptogams, and "Culture") for research and instruction, each presided over by a professor and assistants.

Publications: Archives (est. 1802); Bulletin (est. 1895); Mémoires (est. 1935); Publications (est. 1933); and fifteen periodicals, including the following on botany or of botanical interest: 1. Notulae Systematicae (pub. by Phanerogamic Laboratory); 2. Index Seminum in Hortis Musaei Parisiensis collectorum (pub. by Le Laboratoire de Culture); 3. Recueil des Travaux du Laboratoire de Physique Végétale; 4. Revue de Botanique Appliquée et d'Agriculture Coloniale; 5. Bulletin du Laboratoire d'Agronomie Coloniale; 6. Publications du Laboratoire d'Agronomie Coloniale; 7. Revue Algologique; 8. Revue Bryologique et Lichenologique; 9. Revue de Mycologie; 10. La Terre et la Vie (pub. by La Société des Amis du Muséum et la Société Nationale d'Acclimatation. See, also, Samoëns, p. 213).

PARIS (2)

JARDIN BOTANIQUE DE LA FACULTÉ DE PHARMACIE DE PARIS

4 Avenue de l'Observatoire, Paris VI

Established: 1882. *Area:* 8000 square meters.*Directors:*

1. Gaspard Adolphe Chatin (1882–1887)
2. Jean Louis Léon Guignard (1887–1927)
3. Paul Guérin (1927–)

Open daily to students only. *Herbarium* of officinal plants. *Plantations:* Systematic, and an "Alpinum." *Museum* of drugs of vegetable origin.

Publication: Résumé des caractères des Familles végétales, avec la liste des plantes cultivées en pleine terre et dans les serres et un plan du Jardin. Par Léon Guignard. 5^e éd. Paris (1929).

POITIERS (VIENNE)

JARDIN BOTANIQUE

RENNES (ILLE-ET-VILAINE)

JARDIN DES PLANTES DE LA VILLE DE RENNES

4, Rue de la Palestine

Area about 7 hectares.*Directors:*

- | | |
|------------------------|-------------------------------|
| 1. M. Coleu (?–1906) | 3. Emile Moriceau (1913–1935) |
| 2. M. Marc (1906–1910) | 4. L. Winter (1935–) |

Serves as a public park. *Source of income:* The Municipality. *Herbarium:* 5000 specimens. *Plantations:* Systematic. *Arboretum.* *Fruticetum.* *Publication:* Catalogue des graines récoltées. Loan collections and study material supplied to schools. *Affiliation:* La Faculté des Sciences, de Médecine, Pharmacie, Herboristerie. *Note:* "The Garden was established by M. Martonneau. Unfortunately it is impossible to give you data previous to 1906 as the documents have been destroyed." (Personal letter from the present Director.)

RODEZ (AVEYRON)

JARDIN BOTANIQUE ET D'ESSAIS DE L'ÉCOLE NORMALE DES
INSTITUTEURS

ROUEN (SEINE-INFÉRIEURE) (1)

JARDIN BOTANIQUE DE ROUEN

114, Rue d'Elbeuf

Established: 1756. *Area:* One hectare.

1st Jardin Botanique (Quartier Bouvreuil), 1735–1756.

2nd Jardin Botanique (Cours Dauphin), 1756–1838.

Professors of Botany:

1. Aimable Pinard (1756–1793)

2. Louis Guersent (1804–1810)

3. Alexandre Marquis (1811–1828)

4. Felix Archimede Pouchet (1829–1851)

?. Eugène Le Graverend, Directeur, Promenades et Jardins Publics (1926–)

Serves as a public park. Open free to the public at all times. *Source of income:* The city of Rouen. *Herbarium:* Flore normande (1600 species and varieties); Flore utilitaire; Flore biologique. *Plantations:* Flore normande, classification of M. Corbière (a Normandy botanist). *Arboretum:* "In the Park." "École fruitière indépendante." *Classes from schools* frequently visit the Garden. *Study material* supplied to École des Sciences and École de Médecine. *Publication:* Catalogue des Graines.

Note: The above information follows our questionnaire, returned July, 1938 by Eugène Le Graverend. Loudon (History of Gardening) mentions a botanic garden in Rouen of two acres when first laid out; in 1840 removed to a new site of 20 acres, with plants arranged systematically according to Jussieu "as modified by Marquis," and including a collection of fruit trees, an arboretum, and a fruticetum. See Rouen (2).

ROUEN (SEINE-INFÉRIEURE) (2)

JARDIN DES PLANTES DANS LE PARC DE TRIANON

Address: Jardin Botanique de Rouen

Established: 1837.

Planned and laid out by Désiré Lejeune.

Professors of Botany:

1. F. A. Pouchet (1837–1851); 2. Emmanuel Blanche (1883–1896); 3. Eugène Mesnard (1897–1922); 4. Albert Guillaume (1923–1936); 5. René Boitteux (1937–).

Professors of Arboriculture:

1. Alphonse du Breuil, fils (1841–1848); 2. Prevost (1849–1855); 3. Beaucantin (1856–1879); 4. Lucet (1880–1895); 5. Eugène Vिलाire (1896–1926); 6. Eugène Le Graverend (1926–).

SAMOËNS (HAUTE-SAVOIE)

JARDIN ALPIN DE LA JAYSINIA

Established by the physician, M. Cognacq-Jay, this “remarkable garden” was preserved by the Forest Service and then committed to the Muséum National d’Histoire Naturelle.

SAVERNE (BAS-RHIN)

JARDIN BOTANIQUE DU COL DE SAVERNE

16 Rue de la Gare, Saverne

Established: 1931. *Area:* 1 hectare.

Director (President-Founder): Emile Walter (1931–)

Open to the public on Sundays and holidays, 10 a.m.–12 m.; 3–6 p.m. *Admission:* 50 French centimes. *Source of income:* The Society: “Les Amis du Jardin Botanique du Col de Saverne.” *Library:* About 1000 volumes. *Herbarium:* About 6000 specimens. *Plantations:* Economic. *Lectures are given to school children* and study material is supplied to schools. Specializes in rock plants and alpines, and European ferns, especially hybrids.

STRASBOURG (BAS-RHIN)

JARDIN BOTANIQUE DE L’UNIVERSITÉ

7, Rue de l’Université

Established: Old Garden, 1619. New Garden, 1882 (1883?).

Area: 5 hectares.

Directors:

1. Heinrich Anton de Bary (1882–1888). Professor from 1872.
2. Hermann Graf zu Solms-Laubach (1888–1908)
3. Ludwig Jost (1908–1918)
4. Ch. Flahault (1919)
5. C. Houard (1919–1933)
6. H. Chermezon (1934–)

Open free, daily, 7 to 12 (noon); 2 to 5 p.m. *Source of income*: Governmental appropriations. *Library*: 20,000 volumes (Institut Botanique). *Herbarium*: 2500 bundles (Institut Botanique). *Arboretum and Fruticetum*. *Plantations*: Systematic, geographic, economic, ecologic. *Publication*: Seed List. *Affiliation*: The Garden is affiliated with the Faculty of Sciences of the University of Strasbourg.

TALENCE

JARDIN BOTANIQUE DE TALENCE

See Bordeaux (1)

TARBES (HAUTES-PYRÉNÉES)

JARDIN DE LA VILLE DE TARBES

Director: Emile Moriceau (1911–1913).

TOULOUSE (HAUTE-GARONNE)

JARDIN BOTANIQUE DE LA VILLE DE TOULOUSE

Established: 1730. *Area*: 1.5 hectares.

Directors:

1. Antoine Sage (1730–1756)
2. Guillaume Dubernard (1756–1784)
- 2a. Phillipe Picot, co-director (1778–1784)
(Fide Gerber, l.c., p. 796.)
3. Phillipe Picot de Lapérouse, director (1784–1793)
4. "Citoyen" Limes (1793–1794)
5. Guillaume Dubernard (1795–1796)
6. Phillipe Picot de Lapeyrouse (Lapérouse) (1796–1816)
7. Isidore Picot, Baron de Lapérouse (1816–1834)
8. Christian Horace Bénédict Alfred
Moquin-Tandon (1834–1853)
9. Dominique Clos (1853–1907)
10. Adolphe Prunet (1907–1929)
11. Gabriel Nicolas (1929–)

Open daily, 8 a.m. to 6 p.m. *Source of income*: Budget of the City of Toulouse. *Library*: 1500 volumes. *Herbarium*: Herbar Lapérouse. *Plantations*: Systematic. *Publication*: Catalogue des Graines.

The following notes are based on Gerber, C. Les jardins botaniques toulousains, etc. Bull. Soc. Bot. France. 4me Sér. 788-842. 1924.

The early history of the botanic garden of Toulouse falls into three periods: 1. (1728-1778), when the emphasis, in plantations and instruction, was on medicinal plants; 2. (1778-1793), when the emphasis was on the plants of the Pyrenees; 3. (1793-1796), when the main emphasis was again on medicinal plants. The first *garden of simples* dates from 1728 when the apothecary, Antoine Sage, and others petitioned the Conseil de bourgeoisie (December 7) to provide a house and garden to be occupied and conducted by an *Académie de botanique pour y faire des démonstrations de plantes*. On February 14, 1729, the Council voted to establish, not an *Académie de botanique*, but a *Société des Arts et des Sciences*. This was organized at the home of Sage and stated, as its chief object, the main purpose of an Academy of Botany, namely, the establishment and administration of a garden. The above mentioned "garden of simples" of Sage was located near the Tiercerettes. On September 9, 1730 he presented to the Council, on behalf of the Société des Sciences, a petition, which was approved, to establish a garden in the Saint-Sernin quarter, to replace the small one near the Tiercerettes, which had been ceded in 1729 to the Société Tiercerettes. The third aim of the Société was stated as "The demonstration, by the botanists of the Society, of medicinal plants to medical students." The Garden contained more than 1300 species—"more than any other garden in France excepting, only, the Jardin du Roy at Paris."

In 1746 the *Société des Arts et des Sciences* was merged in the *Académie des Sciences de Toulouse*. In 1756 a new Garden of the Academy, situated on the Rue des Fleurs, near the ramparts of St. Michel, replaced the former Garden of the Society in the Saint-Sernin quarter. Dubernard, professor in the Faculty of Medicine, became the first director of this new Garden of medicinal plants, and was sole director until 1778, when Phillipe Picot became associated with him in the directorship. Picot was chiefly interested in the Garden as a place to grow the plants which he collected in his numerous field trips to the Pyrenees, "so that he might study them at his ease." Gradually medicinal plants,

medical students, and their professor were, by 1793, completely eliminated. Dubernard resigned in 1784, being succeeded by Lapérouse (in prison in 1793), and in that year (1784) the *Jardin Botanique de l'Académie* became a *Jardin des Plantes Pyrénéennes de l'Académie*. Lapérouse was followed by "Citoyen" Limes (1793–1794), and Dubernard was made the second professor of botany, in succession to Limes, holding the chair for five and one-half months. Limes established the herbarium of Pyrenees plants, and in 1793 (23 ventôse an II) the Garden became again the *Jardin des Plantes Médicinales*. Subsequently, while Limes was still director, the Council of the departmental directory, in order to secure a larger area and for other reasons, abandoned the Garden of the Academy and established another in the grounds of the monastery of the barefooted Carmelites, called Frescati. This was the *Jardin des Plantes National*, of which, in 1795, Dubernard became director for one year (22 frimaire an III—3 germinal an IV), being succeeded on the latter date by Lapérouse.

TOURS (INDRE-ET-LOIRE)

JARDIN BOTANIQUE DE TOURS

1 Boulevard Tonnellé

Established: 1842. *Area:* 5 hectares.

Directors:

1. Margueron (1849–1852)
2. Le Comte de Villiers du Terrage (1852–1857)
3. David Barnsby (1857–1903)
4. Henri Lemoine (1903–)

Serves as a public park. Open free daily, 6 a.m.–sunset; in winter 7 a.m.–dark. *Source of income:* Appropriations from the city and the Department. *Plantations:* Systematic (according to the system of DeCandolle). *Arboretum* (180 species); *Fruticetum* (230 species). *Publication:* Catalogue des graines récoltées. *Museum:* Open free, Thursdays and Sundays from noon until 4 p.m.

Note: The Garden is divided into two parts: 1. The scientific part, comprising the school (nursery), and the collection of plants of the world. 2. The horticultural part. There are collections of trees and shrubs, and of annual, biennial, and perennial herbs, all

open to the public. In addition, there are five gardens in the city which depend upon this garden for direction and for their supply of decorative plants: 1. Le Jardin Prebaudes d'Oé (about 5 hectares): 2. Le parc Mirabeau ($1\frac{1}{4}$ ha.): 3. Le parc de la Prefecture ($1\frac{1}{2}$ ha.): 4. Le jardin du musée (1 ha.): 5. Several squares comprising, all together, a total of about one hectare. There are about $14\frac{1}{2}$ hectares of gardens in the city of Tours having a scientific character, and open free to the public.

VERSAILLES (SEINE-ET-OISE)

JARDIN BOTANIQUE DE LA TRIANON

Established about 1765 by Louis XV. It is said that it was in this Garden that Bernard de Jussieu, for the first time, arranged growing plants systematically, according to the natural families.

VILLARD—D'ARÈNES (HAUTES-ALPES)

JARDIN ALPIN

L'Université de Grenoble, Grenoble

Established: 1899. *Area:* 1600 sq. meters. *Altitude:* 1670 meters. Located just outside the village of Villard-d'Arènes.

Note: The purpose of this Garden was to acclimate and breed forage plants, culinary herbs, and mountain fruits for the advantage of the inhabitants engaged in daily farming. More than 100 kinds of vegetables were cultivated. Abandoned, about 1908.

French West Africa

HANN (DAKAR, SÉNÉGAL)

JARDIN DES PLANTES DE HANN

Germany

BADEN-BADEN

In 1909 Max Leichtlin was maintaining here a private "botanic garden."

BERLIN

BOTANISCHER GARTEN UND MUSEUM

Direction des Botanischen Gartens und Museums, Königin-
Luise-Strasse 6-8, Berlin-Dahlem

Established: 1646. In Dahlem since 1909. *Area:* 42 hectares.

Directors:

1. Johann Gottlieb Gleditsch (1744-1786)
2. Karl Ludwig Willdenow (1801-1812)
3. Heinrich Friedrich Link (1815-1851)
4. Alexander Braun (1851-1877)
5. August Wilhelm Eichler (1878-1887)
6. Heinrich Gustav Adolf Engler (1889-1921)
7. Ludwig Diels (General Director) (1921-)

Serves as a public park with certain restrictions. Admission is free on Wednesday, Saturday, Sunday and on official holidays; a fee of 25 Pfg. is charged on Monday, Tuesday, Thursday, and Friday. *The Museum* is open from April 1st to Sept. 30th from 11 a.m. to 2 p.m. on Sunday, and from 10 a.m. to 3 p.m. on Wednesday. From Oct. 1st to March 31st on the first Sunday in the month from 11 a.m. to 2 p.m., and each Wednesday from 10 a.m. to 3 p.m. Guides are furnished to groups of individuals at charges varying from 7 Mk. for 10-30 persons (1 guide and 2 instructors) to 26 Mk. for 91-105 persons (4 guides, 7 instructors). *Source of income:* State appropriations. *Library:* For the use of the staff, University students, and botanists generally. 61,000 volumes and pamphlets. Number of periodicals received, 400. *Herbarium:* About 4,000,000 specimens. *Arboretum and Fruticetum:* Together, about 15,000 labeled plants. *Plantations:* Geographic, systematic, ecologic, morphologic, genetic, economic (medicinal and otherwise useful), annual flowers. Extensive *glasshouses* for subtropical and tropical plants. *Periodicals published:* Botanische Jahrbücher für Systematik und Pflanzengeographie. Established by A. Engler, 1881. About 4-5 issues annually. Editor, L. Diels. Notizblatt des Botanischen Gartens und Museums zu Berlin-Dahlem. Established 1895. About 4 issues annually. Offered in exchange. Editor, The Director. Seed List. *Courses of instruction* are given at the Garden in affiliation with the University of Berlin. The affiliated "Botanisches Museum" is an institute of the University of Berlin. Lectures and courses are given for students of that University.

BIELEFELD

BOTANISCHER GARTEN DER STADT BIELEFELD

Director: Gartendirektor Meyerkamp (1936)

BONN A. RHEIN

BOTANISCHER GARTEN DER UNIVERSITÄT BONN

Poppelsdorfer Schloss

Established: 1818. *Area:* 8.5 hectares.*Director:* Johannes (Hans) [Theodor Gustav Ernst] Fitting (1912–).

Open to the public Monday, Wednesday, Friday, 2–7 p.m.
Source of income: Governmental appropriations (*Staat Preussen*).
Plantations: Geographic (in summer plants from the conservatories are placed in their proper groups outdoors), systematic, xerophytes (arranged geographically), medicinal, poisonous, alpine, ecological, agricultural, economic, bog and water plants.

BRAUNSBURG

BOTANISCHER GARTEN DER STAATLICHEN AKADEMIE

Stiftstrasse 4/10

BRAUNSCHWEIG

BOTANISCHER GARTEN DER TECHNISCHEN HOCHSCHULE

Established: 1824 (resp. 1840). *Area:* 1.40 hectares.*Directors:*

- | | |
|-------------------------------|---------------------------|
| 1. F. H. Blasius (1836–1871) | 4. G. Gassner (1917–1933) |
| 2. W. Blasius (1871–1912) | 5. Jaretzky (1933–) |
| 3. Georg Tischler (1912–1917) | |

Serves as a public park. Open free, daily, except Sundays, 7 (resp. 8)–12; 2–7. *Source of income:* From national government, and the sale of publications, plants, and seeds. *Library:* Combined with the library of the Botanical Institute. Only a few books and journals are in possession of the Garden alone. *Herbarium:* At the Botanical Institute. *Arboretum and Fruticetum,* together, comprise about 700 species. *Plantations:* Systematic, ecologic, alpinum. Species cultivated under glass: 1160. *Herbaceous plants* cultivated out of doors: 2000 species. *Publica-*

tion: Seed List. *Museum*: Only in the Institute of the Technische Hochschule. *Supply Material*: Cultivated phanerogamic plants especially for students in pharmacy. Local schools depend upon the garden for all of their material. Beginning with 1913 the Director gives demonstrations of living plants to the students of the Technische Hochschule.

BREMEN (1)

BOTANISCHER GARTEN

Bremen I

Established: 1905. *Area*: About 3 hectares.

Director: Georg Bitter (1905–?).

Serves as a public park. Open daily, 7:30–7:30 in winter; 8–5 in summer. Admission, 1–2 M. *Source of income*: Private. The garden belongs to the family of the founder, F. E. Schulte. *Library*: Reference. *Herbarium*: Small. *Plantations*: geographic, economic, ecologic. The garden is laid out from the viewpoint of plant geography, with groups illustrating variation, mutation, hybridization, economic plants, weeds, and biological groups. *Publications*: Contributions, Monographs, Seed List. *Loan collections and supply material*: Schools of the town and the neighborhood get seeds of the Garden for their school gardens.

BREMEN (2)

BOTANISCHER GARTEN

Hamburgerstrasse 331

Established: 1923. *Area*: About 42 hectares.

Director: E. Nussbaumer. Originally a private enterprise. Since 1923 owned by the City of Bremen. Came under the Park Board in 1937 and is united with the new botanical-zoological Public Park and Rhododendron Park. *Samen-Verzeichnis*.

BRESLAU

BOTANISCHER GARTEN DER UNIVERSITÄT

Göppertstrasse 6–8

Established: 1811. *Area*: 6.5 hectares.

Directors:

1. F. Heyde and Heinrich Friedrich Link (1811–1815)
2. Ludolf Christian Treviranus (1815–1830)

3. Christian Gottfried Nees von Esenbeck (1830–1851)
4. Heinrich Robert Göppert (1851–1884)
5. Adolph Engler (1884–1889)
6. Karl Prantl (1889–1893)
7. Ferdinand Pax (1893–1926)
8. Peter Stark (1926–1928)
9. Johan Buder (1928–)

Open free Wednesdays and Saturdays and on the 1st and 2nd Sundays of the month, 8–12 a.m.; 2–6 p.m. *Source of income:* Appropriations by the State. *Plantations:* Systematic, geographic, ecologic, economic. *Arboretum.* Visited by school classes accompanied by their teachers. The Garden, the herbarium, and the botanical library and museum, constitute the Botanical Institute of the University. *Publication:* Samen-Verzeichnis.

COLOGNE (SEE KÖLN)

DARMSTADT

BOTANISCHER GARTEN DER TECHNISCHEN HOCHSCHULE

Rossdorferstrasse 140

Established: 1814. *Area:* 43,958 sq. meters.

Directors:

1. J. Eduard Hess (1814–1841)
2. Georg Fritz Schnittspan (1841–1866)
3. Eduard Metzler (1866–1867–ad interim)
4. Heinrich Hanstein (1867–1869)
5. Leopold Dippel (1869–1896)
6. Heinrich Schenck (1896–1927)
7. G. Keyl (1927–1928–ad interim)
8. Friedrich Oehlkers (1928–1932)
9. Bruno Huber (1932–1934)
10. Otto Stocker (April, 1934–)

Serves as a public park. Free, daily. *Source of income:* State appropriations; sale of duplicate plants. *Library:* About 30,000 volumes. *Herbarium:* About 40,000 specimens. *Plantations:* Systematic, geographic, ecologic, economic, morphologic. *Arboretum.* *Fruticetum.* *Supplies study material* for the Staatliche Technische Hochschule, and serves as field for physiological investigations.

DÖBELN

BOTANISCHER GARTEN DES KNABENGYMNASIUMS UND DER
HÖHEREN LANDWIRTSCHAFTSSCHULE

Dobeln, Saxony

Established: 1872. *Area:* 65 acres.

DORTMUND

STÄDT BOTANISCHER SCHULGARTEN

Dortmund Brünninghausen

Established: 1931. *Area:* 3.53 hectares, plus Arboretum.

Director (Garten und Friedhofsdirektor): Nose (1931–).

Serves as a public park. Open free daily. *Source of income:* Appropriations by the City. *Library:* Small. *Herbarium:* 4500 specimens. *Plantations:* Systematic, morphologic-biologic, ecologic. *Arboretum* of 3.91 hectares. *Publication:* Das Arboretum (Guide to the plantations).

DRESDEN

STAATLICHER BOTANISCHER GARTEN DRESDEN

Dresden A 16, Stübelallee 2

Established: In present location, 1890. *Area:* 1.5 hectares.

Directors:

1. Ludwig Reichenbach, until 1879
2. Oscar Drude (1879–1921)
3. Franz Neger (1921–1923)
4. Friedrich Tobler (1924–)

Open free, daily, 7 a.m. to 6 p.m. in summer; 8 a.m. to 4 p.m. in winter. Sunday: 8–1, 9–1. *Source of income:* Governmental appropriations. *Library:* Approximately 600 volumes and pamphlets. (That of the affiliated Botanical Institute of the Technical University is one of the best in Europe.) *Herbarium:* Quite small. (That of the Botanisches Institut der Technischen Hochschule is very large.) *Plantations:* Systematic, geographic, economic, morphologic, ecologic, historical. *Arboretum.* *Publications:* Guide; Small Guide; Samen-Verzeichnis. *Occasional lectures* are given to school children at the garden. *Study material* supplied to State schools only. *Affiliations:* The Director of the Garden is also Director of the Botanisches Institut der Technischen Hochschule, Dresden.

DUISBURG

STÄDTISCHER BOTANISCHER GARTEN

Schweitzerstrasse 24, Duisburg am Rhein

Director: J. Leibig (1936). Index Seminum.

ERLANGEN

BOTANISCHER GARTEN DER UNIVERSITÄT

Schlossgarten 4

Established: 1747. *Area:* 2.25 hectares.*Directors:*

1. Casimir Christoph Schmiedel (1747–1763) (Schmidel, *fide* Pritzel)
2. Tunflamm (1765–1769)
3. Johan Christian Daniel Schreber (1769–1810)
4. Goldfuss (1810–1818)
5. Nees von Esenbeck (1818)
6. Schubert (1818–1824)
7. Wilhelm Daniel Joseph Koch (1824–1849)
8. Adelbert Schnizlein (1849–1868)
9. Gregor Kraus (1868–1872)
10. Max Reess (1872–1901)
11. Hans Solereder (1901–1920)
12. Peter Claussen (1920–1922)
13. Kurt Noack (1922–1930)
14. Julius Schwemmle (1930–)

Open free daily, 8–12, 2–6 weekdays; 8–12 Sundays. *Source of income:* Governmental appropriations. *Library and Herbarium* at Botanical Institute. *Plantations:* Systematic, ecologic, genetics, medicinal. Small *Arboretum*. *Publication:* Samentauschliste.

ESSEN

BOTANISCHER GARTEN

Külshammerweg

Established: 1925. *Area:* 300 hectares.*Director:* Herr Korte (1938).

Open daily, 8 a.m. to dark. Admission, 20 Pfg. *Library:* About 500 items. *Herbarium:* Being newly started. *Plantations:*

Systematic, geographic, ecologic, morphologic. *Arboretum*. *Fruticetum*. *Publication*: Heilpflanzen und Rezepte. *Supplies living study material* to local schools, and gives talks to classes in the Garden.

FRANKFURT AM MAIN (1)

BOTANISCHER GARTEN DER JOHANN WOLFGANG
GOETHE-UNIVERSITÄT

Miquelstrasse

Established: 1767. *Area*: About 6.5 hectares.

Director: Friedrich Laibach (1934—).

Serves as a public park. Open daily, 8 a.m. to 5 p.m. *Source of income*: From the Reich, and appropriations by the city of Frankfurt. *Library and Herbarium*: That of the Botanical Institute of the University. *Plantations*: Systematic, geographic, ecologic. *Arboretum* being developed. *Publication*: Index Seminum. Cf. Frankfurt a.M. (2).

FRANKFURT AM MAIN (2)

STÄDTISCHER PALMENGARTEN

Miquelstrasse 61

Established: 1868. *Area*: 60 hectares (since 1938).

Directors:

1. Heinrich Siesmayer (1868–1886)
2. August Siebert (1886–1923)
3. Otto Krauss (1924–1931)
4. Max Bromme (1931—)

Serves as a public park. Open daily until dark. Per diem admission, M. 0.50; annual admission: per individual, M. 13; family card, M. 25. *Source of income*: Entrance fees and city appropriations. *Arboretum* ("Hauptanlage eines Reichsarboretums ist im Entstehen"). *Plantations*: Rock garden, rose garden, summer flower garden, medicinal and culinary herb garden. *Publications*: Palmengarten Mitteilungen; Samentauschliste. *Cooperates* with the local School Garden and with the Botanic Garden of the University. Cf. Frankfurt a.M. (1).

FRANKFURT AM MAIN (3)

BOTANISCHER GARTEN DER DR. SENCKENBERGISCHEN STIFTUNG
Senckenbergischer Botanischer Garten, Frankfurt a.M.

Established: 1766. *Area:* About 9000 sq. meters.

Directors:

1. Johann Heinrich Bäumerth (May 1, 1767–Nov. 17, 1814)
2. Friedrich Karl Isermann (acting) (1814–1816)
3. Johannes Becker (1816–1827)
4. Ch. E. Neef (Hilfsgärtner) (1828–1830)
5. Georg Fresenius (Hilfsgärtner) (1831–Dec. 1, 1866)
6. Heinrich Ohler (1867–June 21, 1876). Became Foundation Gardener (Stiftsgärtner), January 28, 1828.
7. Hermann Theodor Geyler (1876–March 22, 1889)
8. Wilhelm Jännicke (Lecturer from October 1, 1889; later, Director until his death, March 20, 1893)
9. Martin August Johannes Möbius (1893–1927)
10. Peter Stark (1928–November, 1932)
11. Friedrich Laibach (1933–)

Note: Möbius (Geschichte und Beschreibung des botanischen Gartens zu Frankfurt a. M. Senckenbergische Naturforsch. Gesellsch. Bericht. **34**: 117–154. 1903) states that the plan of the botanic garden of the University of Uppsala served Senkenberg as his model. This plan still exists (says Möbius) in the archives of the Senkenberg Foundation. Senkenberg said that his "Hortus Medicus" should not be an ornamental or commercial, but a medical garden.

Open free, daily in summer, except Sundays. *Source of income:* The Senckenberg endowment. *The Herbarium* is in connection with the museum of the Senckenbergischen Naturforschender Gesellschaft. *Plantations:* Systematic. *Publications:* *Berichte der Senckenbergischen Naturforschenden Gesellschaft* (since 1903. Nos. 1–X appeared under the title, *Mitteilungen aus dem botanischem Garten z. Frankfurt a.M.*). *Seed List.* *Museum:* The museum of the Senckenb. Naturf. Gesellschaft. *Loan collections:* The Museum has loan collections of herbarium specimens, dried seeds, alcoholic material, microscopic slides, economic plant products, photographs. *Study material:* Living material of cultivated phanerogamic, and of cryptogamic plants, is supplied to public and private schools occasionally when requested.

FREIBURG

BOTANISCHER GARTEN UND BOTANISCHES INSTITUT DER GROSS-
HERZOGLICHEN BADISCHEN ALBERT-LUDWIGS UNIVERSITÄT

Schänzlestrasse 9/11

Established: About 1605 (?). *Area:* About one hectare.

Directors:

1. J. L. Baader (1767) (regarded as the real founder)
2. Karl Julius Perleb (1826–1845)
3. Heinrich Anton de Bary (1860–1867)
4. Friedrich Oltmanns (1907?–1931)
5. Friedrich Oehlkers (1932–)

Note: The Institute and present Garden were started in 1913. The Institute buildings were completed in 1913, and the plant houses during 1914.

Library: A small library assembled by Perlot, the second Director. *Herbarium:* About 4000 species, among them some Abyssinian plants collected by Schimper, plants from Australia, and from the Cape. *Arboretum:* One about 150 years old; a later one with trees planted in rays from a central *Paulownia tomentosa*. There is also a *Fruticetum*. *Plantations:* Systematic (according to the system of Endlicher); economic, medicinal. *Museum:* A collection of fruits, woods, drugs, etc., used to illustrate lectures. *Publication:* Seed List.

GERA

BOTANISCHER GARTEN ZU GERA-REUSS

Botanischer Garten, Gera, Reuss-Schleiz (Thüringen)

Established: 1896.

Directors: Robert Leube (1895–1909); G. Hahn (1909–?).

Serves as a public park. Open daily, on week days. *Sources of income:* Endowment; annual appropriations by city. *Herbarium:* In the botanical museum. *Plantations:* Local flora of Gera and vicinity. *Museum:* May be visited with the permission of the director.

GIESSEN

BOTANISCHER GARTEN DER UNIVERSITÄT GIESSEN

Established: 1609. *Area:* 4 hectares.

Director: Ernst Küster (1938).

Serves as a public park. Open daily, 8 to 12 a.m. and 2 to 5 p.m.; Sundays, 9 to 12 a.m.

GÖRLITZ

STÄDTISCHER BOTANISCHER GARTEN

Director: Max Geissler (1909).

GÖTTINGEN

BOTANISCHER GARTEN

Established: 1734. *Area:* 4 hectares.

Directors:

1. Johann Wilhelm Albrecht (1734–1735)
2. Albrecht von Haller (1736–1753)
3. Johann Gottfried Zinn (1753–1759)
4. Rudolf August Vogel (1759–1760)
5. Sigismund August Büttner (1760–1768)
6. Johann Andreas Murray (1769–1791)
7. Georg Franz Hoffman (1791–1802)
8. Heinrich Adolf Schrader (1802–1836)
9. Friedrich Gottlieb Bartling (1836–1875)
10. August Griesebach (1875–1879)
11. Hermann Graf zu Solms-Laubach (1879–1888)
12. Gustav Albert Peter (1888–1923)
13. Georg Bitter (1923–1927)
14. Fritz von Wettstein (1927–1931)
15. Richard Harder (1932–)

Open free, daily. Admission to Greenhouses, 50 pfennig. *Source of income:* Supported by governmental appropriations. *Herbarium:* About 50,000 specimens. *Plantations:* Systematic, geographic, morphologic, ecologic. *Museum* is not open to the public. *Affiliation:* Universität Göttingen.

GREIFSWALD

BOTANISCHER GARTEN DER ERNST MORITZ ARNDT UNIVERSITÄT
Grimmerstrasse 86/88

Director: Paul Metzner (?–1935); Erich Leick (1936–). *Publication:* Samen-Verzeichnis.

HALLE

BOTANISCHER GARTEN DER MARTIN LUTHER UNIVERSITÄT
Am Kirchtor 1, Halle (Saale)

Established:

The "Hortus Medicus," by Churfürst Friedrich III (April 11, 1698).

The "Fürstengarten" acquired for the University by Chancellor von Hoffmann (September 28, 1787).

The present Garden (1932).

Directors:

1. Georg Ernst Stahl (1698–1715)
2. Michael Alberti (1716–1749)
3. Christian Karl Strumpf (1749–1751)
4. Andreas Elias Büchner (1751–1769)
5. Philipp Caspar Junghans (1770–1797)
6. Kurt Sprengel (1797–1833)
7. D. F. L. von Schlechtendal (1833–1866)
8. Anton de Bary (1866–1871)
9. Gregor Kraus (1872–1898)
10. Georg Klebs (1898–1907)
11. Fritz Noll (1907–1908)
12. George Karsten (1909–1928)
13. Kurt Noack (1930–1931)
14. Wilhelm Troll (1932–)

Serves as a public park. Open free, daily. *Source of income:* Government grant. *Herbarium:* The Endlicher system. *Plantations:* Systematic (Engler system). *Publication:* Seed Exchange List. *Note:* Friedrichs-Universität Halle, founded in 1502, was united with Wittenberg in 1694. In 1935 it was re-christened "Martin Luther Universität Halle-Wittenberg."

HAMBURG

BOTANISCHER GARTEN

Institut für allgemeine Botanik, Jungiusstrasse 6, Hamburg 36

Established: 1821. *Area:* 9.4 hectares.

Directors:

1. Johann Georg Christian Lehmann (1821–1860)

2. Heinrich Gustav Reichenbach (1863–1889)
3. Eduard Zacharias (1894–1911)
4. Johannes (Theodor Gustav Ernst) Fitting (1911–1912)
5. Hans Winkler (1912–)

Serves as a public park. Open free to the public, daily, 7 a.m. until dark. *Source of income:* City budget of Hamburg. *Library:* Connected with the Staats-Institut für allgemeine Botanik. *Herbarium:* About 500,000 specimens. *Plantations:* Systematic, economic, morphologic, ecologic. *Arboretum.* *Fruticetum.* *Publications:* Mitteilungen aus dem Institut für allgemeine Botanik in Hamburg. Offered in exchange. Seed List (*Index Seminum*). *Museum:* Open daily from 10 a.m. to 4 p.m. *Living material* is supplied regularly to both public and private schools. For this purpose there is a nursery of about 5 hectares from which schools may obtain material free on application. *Affiliations:* Hamburg University.

HANN. MÜNDEN (SEE MÜNDEN)

HEIDELBERG

BOTANISCHER GARTEN DER UNIVERSITÄT HEIDELBERG

Tiergartenstrasse

Established: 1593. *Area:* 3.9224 Hektar.

Directors:

1. Wilhelm Friedrich Benedict Hofmeister (1863–1872)
2. Ernst Hugo Heinrich Pfitzer (1872–1907)
3. Georg Klebs (1907–1918)
4. Ludwig Jost (1918–1934)
5. August Seybold (April, 1934–)

Serves as a public park. Open free daily in summer, 7 a.m. to 6 p.m.; in winter, 8 a.m. to 4:30 p.m. Admission to the conservatories: 10 and 5 Pfennig. *Source of income:* Supported by Governmental appropriations through the Kultusministerium. *Library:* Small. *Herbarium:* Number of specimens unknown. *Arboretum and Fruticetum.* *Plantations:* Geographic, systematic, biologic-morphologic; medicinal plants, poison plants, horticultural plants, Alpine, aquatic and swamp plants, heath plants, cultivated plants. *Publications:* Guide, "Führer durch den Botanischen Garten," by Ludwig Jost. Verzeichnis von Sämereien. *School classes* are brought to the Garden by their instructors. *Study material* is supplied to schools on request.

HOHENHEIM BEI STUTTGART

BOTANISCHER GARTEN DER LANDWIRTSCHAFTLICHEN
HOCHSCHULE

Established: 1829. *Area:* 4.88 hectares.

Directors: Franz von Fleischer (1837–1878) ; Oskar von Kirchner (1878–?).

Serves as a public park. Open free, daily, at all hours. *Sources of income:* Annual appropriations by the State; the sale of publications, plants, and seeds. *Library:* Bibliothek des Botanischen Institutes. Number of volumes more than 3000. *Herbarium:* More than 33,000 specimens. *Plantations:* Systematic, ecologic, economic. *Arboretum.*

INSTERBURG

BOTANISCHER STADTGARDEN

Verwaltung des Botanischen Stadtgartens, Forchestrassé 6,
Insterburg, Ostpreussen.

Established: April 1, 1933. *Area:* 7.5 hectares.

Director: W. Fritsch (April 1, 1933–).

Serves as a public park. Open daily, 9 to 12 a.m. and 2 to 5 p.m. Admission 0.10 RM. *Source of income:* City appropriations. *Library:* Newly established; about 150 volumes. *Plantations:* Systematic. *Arboretum.* Special lectures are given, and study material and loan collections are supplied to school classes.

JENA

BOTANISCHER GARTEN DER FRIEDRICH SCHILLER UNIVERSITÄT

Established: ?. *Area:* 2.75 hectares.

Directors:

- | | |
|----------------|---|
| 1. Rolfink | 7. Friedrich Siegmund Voigt (?–1850) |
| 2. Schlegel | 8. Matthias Jacob Schleiden (1851–1862) |
| 3. Schelhammer | 9. Nathan Pringsheim (1864–1870) |
| 4. Schenk | 10. Edward Strasburger (1870–1881) |
| 5. Baldinger | 11. Ernst Stahl (1881–1919) |
| 6. Batsch | ?. Otto Renner (1928–) |

Open daily without charge. *Source of income:* Appropriations by the State through the University. *Herbarium:* 15,500 speci-

mens. *Arboretum and Fruticetum* combined: 2000 species. *Plantations*: Arboretum arranged systematically and geographically. Herbaceous plants, systematically and ecologically.

KARLSRUHE

BOTANISCHER GARTEN DER TECHNISCHEN HOCHSCHULE

Kaiserstrasse 2, Karlsruhe, Baden

Established: 1880. *Area*: 1.5 hectares.

Directors:

1. L. Fust (1880–1891)
2. Ludwig Klein (1891–1929)
3. Wilhelm Schwartz (1929–)

Serves as a public park. Open free daily. *Source of income*: Appropriations of the State. *Plantations*: Systematic, ecologic, economic. *Arboretum*. *Publication*: A Seed List, discontinued in 1910 (as per circular of announcement of October, 1910), to be again issued yearly after the completion of the new layout (*Neuanlage*) of the Garden.

KASSEL

BOTANISCHER GARTEN DER STADT KASSEL

Murhardstrasse 19 b I

Director: Hermann Schultz (1938). Seed List.

KIEL

BOTANISCHER GARTEN DER UNIVERSITÄT

Düsternbrookerweg 17–19

Established: 1st. 1669. *Reestablished*: 1883–1890. *Area*: 3.5 hectares.

Directors:

1. August Wilhelm Eichler (1873–April, 1878)
2. Adolf Engler (April 5, 1878–Dec. 4, 1884)
3. Johannes Reinke (Dec. 5, 1884–April 1, 1921)
4. Heinrich Schröder (April 1, 1921–Oct. 1, 1922)
5. Georg Tischler (Oct. 1, 1922–)

Serves as a public park. Open free daily. *Source of income*: The State of Prussia. *Library and Herbarium* (about 10,000 spe-

cies) same as that of the Botanical Institute of the University. *Plantations*: Systematic, geographic. *Publication*: Samenverzeichnis.

KÖLN (COLOGNE)

BOTANISCHER GARTEN DER HANSESTADT KÖLN

Köln-Riehl, Am Botanischen Garten 19

Established: 1st, 1892; 2nd, 1920 (by merger with the former Garden of 12.5 acres founded in 1912). *Area*: 29.5 acres.

Directors: 1. Peter Esser (1892–1928); 2. Hermann Sierp (1928–). (Dates as given on the questionnaire returned by the Köln Garden.)

The main part of the Garden is open free daily "from morning until dusk." *Conservatories*: Week days from 10 to 12 a.m., 2 to 5 p.m. Sundays, 10 a.m. to 1 p.m. and 3 to 5 p.m. *Source of income*: Owned and maintained by the City of Cologne. The director is also director of the Botanical Institute of the University. *Plantations*: Systematic, alpine, two ponds, ecological, geographical, genetical, subtropical economic plants. *Arboretum* (including shrubs). A replica of the oldest definitely known garden in Germany, after that of Walafrid Strabo (825 A.D.). Under construction a "systematic Rosarium." Projected, divisions for medicinal, culinary, and economic plants. *Samen-Verzeichnis*.

Note: There also remains in Köln-Zollstock a portion of an older botanic garden (about 2 hectares) where the Botanical Institute of the University is located. This serves chiefly to supply the plant material needed for the educational and research work of the Institute, and for the propagation of the large quantities of plants supplied to the city schools. From the middle of April to the middle of September a supply of fresh plants is sent each week to about 120 schools for class use. Not open to the public.

KÖNIGSBERG

BOTANISCHER GARTEN DER UNIVERSITÄT

Besselstrasse 6/7

Director: K. Mothes (March 1, 1935–).

Serves as a public park. Open daily except Sunday. *Library*: 10,000 volumes. *Herbarium*: 60,000 specimens. *Arboretum*

Fruticetum. Lectures are given to school children and *study material* is supplied to schools. *Publication:* Seed List.

KREFELD

BOTANISCHER GARTEN DER STADT KREFELD-UERDINGEN AM
RHEIN

Gartenamt der Stadt Krefeld, Nordwall Nr. 84

Director: Noell (1936). *Plantations:* Systematic. *Arboretum:* Outside the main garden. About 700 species of conifers. Seed List.

LEIPZIG

BOTANISCHER GARTEN DER UNIVERSITÄT
Linnéstrasse 1, Leipzig C 1

Established: 1st Garden, 1542; 2nd, 1877. *Area:* 3.1 hectares.
Directors: 1. Johann Hedwig (1789–1799); 2. Romanus Adolph Hedwig (1799–1806); 3. Christian Friedrich Schwaegrichen (1806–1837); 4. Gustav Kunze (1837–1851); 5. Georg Heinrich Mettenius (1852–1866); 6. August Schenk (1868–1887); 7. Wilhelm Pfeffer (1887–1920); 8. Friedrich Czappek (1920–1921); 9. J. Buder (1921–1922); 10. W. Ruhland (1922–).

Open free, Monday to Saturday, 7 a.m. to 6 p.m. *Source of income:* Government appropriations. *Plantations:* Geographic, economic, morphologic, ecologic, systematic. *Arboretum.*

MARBURG

BOTANISCHER GARTEN DER UNIVERSITÄT MARBURG
Pilgrimstein 4, Marburg an der Lahn

Established: 1810–1815. *Area:* 4 hectares.

Directors:

1. Georg Wilhelm Franz Wenderoth (1810–1861)
2. Albert Wigand (1861–1886)
3. Karl Immanuel Eberhard Goebel (1886–1891)
4. Paul Arthur Meyer (1891–1921)
5. Peter Claussen (1922–)

Serves as a public park. Open free all day, week-days; forenoons on Sundays. *Source of income:* The garden is supported

by the Prussian State together with the University of Marburg. *Library* of 5000 volumes and 15,000 pamphlets is combined with that of the Botanical Institute. *Herbarium*: The exact number of specimens is not known. *Plantations*: Systematic, geographic, economic, ecologic. *Arboretum*. *Fruticetum*. Number of cultivated species, 6500. *A small museum* is free for the use of docents and students. *Publication*: Verzeichnis der abgebbaren Sämereien. *Supplies living material* for study to local schools on request, but does not do so regularly. *Affiliation*: With the University of Marburg. Wenderoth is considered the chief founder of this Garden. There was an earlier garden laid out in 1787 by Conrad Moench on the south slope of Augustenruhe mountain north of Ketzerbach Strasse.

MERSEBURG

ALPENGARTEN ZOESCHEN (FORMERLY NATIONAL ARBORETUM)

Zoeschen bei Merseburg, Sachsen

Established: 1896. *Area*: 1.5 hectares.

Director: Georg Dieck (1934). In office in 1912.

Serves as a public park. Open free, daily. Admission on application. *Library*: Small. *Herbarium*: Cryptogams, about 2500; Phanerogams, about 4000. *Plantations*: Geographic. *Arboretum*. *Fruticetum*. *Publication*: Bog and alpine plants. 1900. *Living material* supplied to local schools when requested.

MÜNCHEN (MUNICH)

BOTANISCHER GARTEN

Mensingenstrasse 13, München 38 (Nymphenburg)

Established: 1st, 1809; 2nd, 1909. *Area*: 18.706 hectares.

Directors:

1. Franz Paula von Schrank (1812–1832)
2. Carl Friedrich Philipp von Martius (1832–1854)
3. Interregnum? (1855–1856)
4. Carl Wilhelm von Nägeli (1857–1891)
5. Karl Immanuel Eberhard von Goebel (1891–1930)
6. Fritz von Wettstein (1931–1934)
7. Friedrich Carl von Faber (1934–)

Open daily, 8 a.m. to 8 p.m. Admission 20 Pfg. *Conservatories*: 10 a.m. to 1 p.m. and 2 to 7 p.m. 50 Pfg. *Museum*: Sat-

urday and Sunday, 4 to 6 p.m. *Library*: 800 volumes, about 300 pamphlets. *Herbarium*: 10,000 specimens. *Publications*: Seed List, Guides.

Plantations: I. Horticultural Section (*Ziergarten*); II. Ecological Groups, including Ecological division, Alpine plants, Heath, Moor, Dune, Pond, Fern-ravine with Rhododendrons, Plant geography of Bavaria; III. Useful, Medicinal, and Poisonous plants; IV. Systematic. *Arboretum*. *Fruticetum*. *Affiliation*: Universität München. *Note*: The Munich Garden is younger than most other German botanic gardens. This, says Goebel (*Führer durch die Freilandanlagen des Bot. Gartens in München*. 1923), is associated with the fact that it was not until the 19th century that Munich became the seat of the Bayerische Akademie der Wissenschaften (1807) and later (1826) of the University. From the first the Botanic Garden was an activity of the Academy of Sciences. The first garden (Königlicher Botanischen Garten) had an area of 5.1 ha. It was laid out by the first director, Prof. Franz Paula von Schrank, and was first opened to the public in 1812. It continued for about 100 years, but deteriorated owing to the encroachment of the city. Nägeli suggested its removal, and this was accomplished by Goebel in 1909–10 (to Nymphenburg suburb). It was completely reorganized (1911–1914) under Goebel's direction.

MÜNDE (HANNOVERSCH MÜNDE)

BOTANISCHER GARTEN DER FORSTLICHEN HOCHSCHULE
HANN. MÜNDE

Mitscherlichstr. 5, Hann. Münden

The designation is "Hann. Münden," abbreviation for "Hannoversch Münden." Any other, such as "Hannover-Münden," is incorrect and should not be used.

Established: 1868. *Area*: 3 hectares.

Directors:

1. Bernhard Borggreve (1868–1872)
2. N. J. C. Müller (1872–1901)
3. Moritz Büsgen (1901–1920)
4. E. Jahn (1921–1937)
5. Th. Schmucker (1938–)

Open free daily, 8 a.m. to 6 p.m. *Source of income*: Government appropriations. *Herbarium*: A small reference herbarium.

Plantations: Systematic, geographic, ecologic. *Arboretum*. *Fru-
ticitum*. *Publication*: Seed List.

MÜNSTER

BOTANISCHER GARTEN DER WESTFÄLISCHEN WILHELMS-
UNIVERSITÄT

Schlossgarten 3, Münster i. W.

Established: 1804. *Area*: 4.5 hectares.

Directors: Carl Correns (1909–1915); Wilhelm Benecke (1915–
June 30, 1935); Walter Mevius (July 1, 1935–).

Serves as a public park. Open free daily, 7 to 12 a.m. and 4 to
7:30 p.m. *Source of income*: Supported by the Prussian state.
Library: 200 volumes. *Plantations*: Systematic, ecologic, medici-
nal (new). *Arboretum*. *Publication*: Samenverzeichnis. Lec-
tures to school children on request.

MUNICH (SEE MÜNCHEN)

ROSTOCK

BOTANISCHER GARTEN DER UNIVERSITÄT

Doberanerstrasse 143

Director: Hermann von Guttenberg (1936). Samenverzeichnis.

SANGERHAUSEN

ROSARIUM DES VEREINS DEUTSCHER ROSENFREUNDE

Sangerhausen, Sachsen

Established: 1903. *Area*: 10 hectares.

Director: Ewald Gnau (1903–?). Vacant (April, 1938).

Serves as a public park. Open daily, 6 a.m. “till evening.”
Admission: 30 Pfg. *Source of income*: Annual appropriation by
the city, the county and other courts, admission fees. *Govern-
mental appropriation*: 1937, RM 5,000. *Library*: 750 volumes and
pamphlets. *Herbarium*: 500 wild roses. *Plantations*: Roses only,
classified systematically-morphologically, about 5000 varieties gar-
den roses, 700 varieties wild roses—about 50,000 bushes in all.
Publications: Jahrbuch des Vereins Deutscher Rosenfreunde; Die
Rose als Object der Züchtung, by Dr. H. v. Rathlef, 1937. *Spe-
cial lectures* are given to school children at the garden when
desired.

THARANDT (BEI DRESDEN)

FORSTBOTANISCHER GARTEN, THARANDT I. SA.

Established: 1811. *Area:* 13 hectares.*Directors:*

- | | |
|----------------------------|-------------------------|
| 1. Reum (1816–1839) | 5. Nobbe (1868–1904) |
| 2. Rossmässler (1840–1850) | 6. Neger (1905–1920) |
| 3. Stein (1850–1855) | 7. Münch (1921–1933) |
| 4. Willkomm (1855–1868) | 8. Bruno Huber (1934–) |

Serves as a public park. Open free daily, 8 a.m. to 6 p.m.
Source of income: The State. *Plantations:* Main part systematic;
 geographic groups for North America, Eastern Asia, Caucasus;
 small ecologic groups. *Arboretum.*

TÜBINGEN

BOTANISCHER GARTEN DER UNIVERSITÄT

Wilhelmstrasse 5

Established: About 1815. *Area:* 4 hectares.*Directors:*

1. Hermann Vöchting (1887–1912)
2. Eugen Otto Willy Ruhland (1919–1922)
3. Ernst Lehmann (1922–)

Serves as a public park. Open free daily, 7 a.m. to 6 p.m.;
 Sundays, 11 a.m. to 5 p.m. *Source of income:* The State. *Li-*
brary: 500 volumes. *Herbarium:* Number of specimens “not
 determined.” *Plantations:* Systematic, geographic, ecologic. *Ar-*
boretum. *Publication:* Samenverzeichnis. *Supplies living plant*
material for study to schools.

WÜRZBURG

BOTANISCHER GARTEN DER UNIVERSITÄT

Klinikstrasse 1

Established: 1782. *Area:* 1.82 hectares.*Director:* H. Burgeff (1938).

Serves as a public park. *Source of income:* The State. *Plan-*
tations: Systematic, economic, ecologic, genetic. *Publication:*
 Samenverzeichnis.

ZÖSCHEN (BEI MERSEBURG)

ALPENGARTEN (See Merseburg)

Gold Coast Colony

ABURI

ABURI BOTANIC GARDENS

Established: 1889. *Area:* 46 acres.

Under the Department of Agriculture. No separate director.

Serves as a public park. Open free at all times. *Source of income:* Government funds. *Herbarium* transferred to the Economic Botanist at another station. *Plantations:* Blocks of cocoa, coffee, para rubber, and specimen trees and shrubs.

Great Britain

ABERDEEN

CRUICKSHANK BOTANIC GARDEN OF THE UNIVERSITY

The Chanonry, Old Aberdeen, Scotland

Established: 1898. *Area:* 12 acres.*Directors:*

1. James W. H. Trail (1898–1919)
2. W. G. Craib (1920–1933)
3. J. R. Matthews (1934—)

Open free daily, except Sunday. *Source of income:* Special Trust. *Herbarium:* "Good British herbarium." *Museum:* Open free daily, except Sunday. The Botanical Department of the University is situated in the Garden.

BIRMINGHAM

BOTANICAL GARDENS

Established: 1829. Administered by the Birmingham Botanical and Horticultural Society. *Curator:* Thomas Humphreys (1929).

BRADFORD

BRADFORD BOTANICAL GARDENS

Botanical Gardens, Lister Park, Bradford, Yorkshire, England

Established: 1903. *Area:* 2 acres.*Director:* Michael Malone (1903—)

Serves as a public park; Lister Park, comprising 55 acres, is open to the public at all hours, free of charge. The Botanic Garden (2 acres) is part of and in Lister Park. Lister Park also has a resident Head Gardener. Museum and Picture Gallery are also situated inside the Park. *Source of income*: Bradford City Parks Committee. *Library*: Only a small library. *Herbarium*: In Cartwright Hall, the British Flora. *Arboretum and Fruticetum*. *Plantations*: Systematic, geographic, economic, ecologic. *Museum*: Cartwright Hall in the Park. Open free, 10 a.m. to 5 p.m. *Special lectures* are given to school children.

BRISTOL

BRISTOL UNIVERSITY BOTANIC GARDEN

Established: ?. *Area*: About 3 acres.

Directors: O. V. Darbyshire (1911–1934); Macgregor Skene (1934–).

Open free to the public weekdays, 9 a.m. to 5 p.m. *Source of income*: Budget of the University. *Library and Herbarium*: That of the Department of Botany. *Plantations*: Systematic. *Publication*: Annual Seed List.

CAMBRIDGE

UNIVERSITY BOTANIC GARDEN

Bateman Street

Established: 1762 (on present site 1846). *Area*: 21 acres. An additional 17 acres adjoining belongs to the University, and is now (1934) let in allotments, which are available for future extension.

Director: There is a Director, who is also University Lecturer in Botany, and a Superintendent, who manages the horticultural side of the Garden.

Curators: Before the institution of a Directorship in 1920, the chief official was the Curator, R. I. Lynch.

Open free to the public on all weekdays from 8 a.m. until dusk. Plant houses open only during the afternoon. The Garden is open on Sundays to members of the Senate of the University on payment of ten shillings a year, and to non-members of the University on payment of £1 a year. The University reserves its private rights in the Garden by closing it to the public one day in the year.

Source of income: Chiefly University grant. *Plantations:* Systematic. *Arboretum.* *Fruticetum.* *Publications:* *Delectus seminum ex horto Cantabrigensis Academiae ad mutuam commutationem propositorum.*

The botanical library, museum, and University Herbarium are located in, and form part of, the Botanical Department of the University (Botany School) under the direction of the Professor of Botany.

Supplies the great bulk of the material used for teaching (approximately 100,000 specimens per year), and a large proportion of that used for research in the Botany School.

Material of all kinds for study is sold to local schools. The plant houses consist of eleven houses open to the public. There are also four "pits" and one plant house not open to the public. In addition to the plantations mentioned above there are a Rock Garden and Bog and Water Gardens. There is a special collection of Bamboos. The plants in the entire garden are arranged according to the natural system of De Candolle.

Affiliations: The Cambridge Botanic Garden belongs to the University of Cambridge and is a department of the Botany School. It is governed for the University by the Botanic Garden Syndicate, consisting of (1) the Governors of the Botanic Garden (viz. the Vice-Chancellor of the University, the Masters of Trinity and St. John's Colleges, the Provost of King's College, the Regius Professor of Physics, and the Professor of Botany, all *ex officio*, and (2) six additional syndics, each appointed for two years, from among the resident members of the Senate (i.e. the whole body of Masters of Arts and other higher graduates of the University having their names on the University Registrar) by Grace (i.e. resolution of the Senate).

The Botanic Garden Syndicate meets once a year, when a report is made to the Senate. It is published in the University Reporter. There is also an Executive Committee which meets at least three times a year to discuss the working and management of the Garden.

CHELSEA (LONDON)

CHELSEA PHYSIC GARDEN

Royal Hospital Road, Chelsea, London, S.W. 3, England

Established: 1673. *Area:* 3½ acres.

Directors (official title "Curator") :

1. Richard Pratt (1677–1680)
2. John Watts (1680–1693)
3. Samuel Doody (1693–1695)

4. Isaac Rand (1720)
5. Philip Miller (1722–1770)
6. William (?) Forsyth (1771–1784)
7. John Fairbairn (1784–1814)
8. William Anderson (1814–1846)
9. Robert Fortune (1846–1848)
10. Thomas Moore (1848–1887)
11. William Hales (1899–1937)
12. George William Robinson (1937–)

From 1887 to 1899 no one occupied the position of Curator, the Garden being conducted by three laborers. Upon the transfer of the Garden in 1899, from the Apothecaries Society to the present trustees, the London Parochial Charities, the late William Hales was appointed.

Open daily to students and to visitors upon presentation of a ticket of admission, to be obtained from the Clerk to the Committee of Management, 3, Temple Gardens, London E. C. 4, free of charge. *Source of income*: Endowment and annual contributions provided by the Trustees of the London Parochial Charities, and in addition appropriations by the National Government and London University yearly. *Library*: Reference, small, about 400 volumes. *Plantations*: Systematic (Bentham & Hooker system). The Garden is arranged systematically in long rectangular beds, about 6 ft. wide, and over 200 natural orders are represented in the open ground. The greenhouses contain plants of purely botanical interest for the supply of the various types of plant morphology, and those of interest historically. *Publication*: Index Seminum. *Lectures* are given at the Garden, and study material, including flowers, leaves, buds, wild plants, and cultivated phanerogams and cryptogams, is supplied to the University of London, Royal College of Science, medical schools, etc., when requested. *Affiliations*: The Imperial College of Science, South Kensington, The University of London, and several Polytechnics. The laboratory, built in 1902, is chiefly used for research work by students of the Imperial College of Science.

DURHAM

BOTANIC GARDEN OF THE UNIVERSITY

University Science Laboratories

Established: 1925. *Area*: About one acre.

Director: Benjamin Millard Griffiths.

This garden is simply the garden of the Department of Botany, and is in the grounds of the University Science Laboratories. It is in no sense an independent institution. It contains the usual Natural Order beds, together with beds containing marsh plants growing on land, *alba* varieties of various plants, and a collection of varieties of *Iris germanica*. There is no Director, nor even a permanent gardener, and it is managed by the head of the Department of Botany.

EDINBURGH
ROYAL BOTANIC GARDEN
Edinburgh, 4, Scotland

Established: 1670. *Area*: 60 acres, 3 roods, 5 poles.

Directors (official title, Regius Keeper) :

1. James Sutherland (1699–1714)
2. William Arthur (1715–1716)
3. Charles Alston (1716–1760)
4. John Hope (1761–1786)
5. Daniel Rutherford (1786–1819)
6. Robert Graham (1820–1845)
7. John Hutton Balfour (1845–1880)
8. Alexander Dickson (1880–1887)
10. William Wright Smith (1922–)

Open free, daily from 9 a.m. on week-days, and from 11 a.m. on Sundays, until sunset. Plant houses are open from 1 p.m. to 5 p.m. or until sunset if this be earlier. *Source of income*: One of three gardens maintained in the state by the United Kingdom. (The other two are the Royal Gardens at Kew, and the Glasnevin Garden, Dublin). *Library*: Reference. Over 20,000 volumes. The leading botanical and horticultural periodicals are taken. *Herbarium*: About 1,500,000 specimens representing the Floras of the world. Specially rich in Asiatic Floras. *Plantations*: *Arboretum*, Woodland Garden, Rock Garden, Rhododendrons, Systematic (Herbaceous garden and herbaceous border. Bentham and Hooker, *Genera Plantarum*). *Publications*: Royal Botanic Garden, Edinburgh—a brief descriptive and illustrated account. Map, Key, Plan and Index to the Royal Botanic Garden. Royal Botanic Garden, Edinburgh, with Key Plan. Notes from the Royal Botanic Garden, Edinburgh (published periodically). Seed List (annually). *Museum*: Contains a series of exhibits illustrating the form and life histories of plants, arranged so as to facili-

tate their use in teaching. Open week-days from 9 a.m. to 5 p.m.; on Sundays from 1 p.m. until sunset. *Lectures*: The Regius Keeper, from time to time, gives lectures which are open to the public. *Supply material*: Specimens for private study are supplied, as far as the resources of the Garden will permit, to visitors and students who make written application to the Regius Keeper. Application forms may be obtained at the office of the garden. *Affiliations*: For more than a century and a half the offices of Regius Keeper of the Botanic Garden and Professor of Botany in the University of Edinburgh have been held by the same person, and it has become the custom that the students of the University go to the garden for instruction in botany. *Instruction*: Special instruction in the sciences underlying the practice of horticulture and forestry is provided for the staff of the garden. The course of instruction is spread over three years, and consists of lectures upon, and practical instruction in, the sciences taught. A reading room and library is also provided for members of the staff taking this course.

Notes: In 1670 a small area, St. Ann's yards, south of Holyrood House was maintained by two physicians, Andrew Balfour and Robert Sibbald, as a Physic Garden. James Sutherland was appointed to the "Care of the Garden." This was the foundation of the Royal Botanic Garden of Edinburgh, the real ancestor of the present Garden, which is (next to Oxford, 1632), the oldest in Great Britain.

"In 1676 the same physicians acquired from the Town Council of Edinburgh a lease of the Garden of Trinity Hospital and adjacent ground for the purpose of a Physic Garden in addition to the Garden already existing at Holyrood, and they appointed the same James Sutherland (16??-1715) to be 'Intendant' of this Garden." This has been referred to as the Town's Botanic Garden. Part of the site is now occupied by the Waverley Station of the London and North Eastern Railway.

"In 1699 the King's Garden, at Holyrood House, also became a Physic Garden, so the connection of the Royal Botanic Garden with the Crown goes back to this period. These gardens were laid out in formal beds devoted to native and foreign plants as well as medicinal herbs, arranged systematically. In 1764 both original gardens were abandoned and combined in a new Garden near Haddington Place, Leith Walk. The plants were here arranged after the then new system of Linnaeus.

“ In 1702 another Botanic Garden was established in Edinburgh adjacent to the College grounds, “ apparently on the site of the present South College Street. This was the College Garden, and of it James Sutherland also became custodian.”—*Anon. The Royal Bot. Gdn., Edinburgh, with Key and Plan. Edinburgh, June, 1912.*

In 1761 John Hope became King's Botanist at Holyrood and subsequently Professor of Botany and Materia Medica at the University. He soon secured the separation of this chair into two and, as Professor of Medicine and Botany, he initiated (1776) the movement for a new Botanic Garden on the outskirts of the City west of Leith Walk, combining the collections at Holyrood and the Town Gardens, and obtained from the Crown a permanent endowment for the new Garden. Under Robert Graham the Garden was transferred to the better site which it now occupies.

By 1823 the growth of the collection necessitated a larger site and the Garden was removed to Broompark or Quacaplesink of 14 acres, part of Innerleith property. Adjacent areas were added in 1865 and 1876. The Arboretum was initiated about 1881.

GLASGOW

CORPORATION OF GLASGOW BOTANIC GARDENS

730 Great Western Road, Glasgow W. 2

Established: 1818. (Royal Charter 1817; opened to the public 1819. They became public property in 1891). *Area:* 47.5 acres.

Directors:

1. William Joseph Hooker (1820–1841)
2. John Hutton Balfour (1841–1845)
3. Walker-Arnott (1845–1868)
4. Alexander Dickson (1868–1879)
5. Isaac Bayley Balfour (1879–1884)
6. Frederick Orpen Bower (1885–1921)
- Hon. Scientific Director (1921–)
7. James Montagu Frank Drummond (1925–Sept. 30, 1930)
8. John Walton (1930–?)
9. William Besant (1938)

Serves as a public park. Open free daily, sunrise to sunset. *Source of income:* Local rates. *Plantations:* Systematic. *Publication:* Seed List. *Study collections and living material* supplied to schools and to University classes on request. According to a note in *Gardener's Chronicle* for September 25, 1937, the Glasgow Gardens were installed at the Kelvinside site in 1839. "Originating on the grounds of the old University, the collection of plants . . . went in 1817 to form the nucleus of the first Botanic Gardens, which was situated at the west end of Sauchiehall Street. In 1887 a Bill for the acquisition of the gardens by the Corporation was passed."

HOLBORN

(Now part of London)

JOHN GERARD'S GARDEN

The "botanic garden" of John Gerard, author of "The herball, or generall historie of plantes. Gathered by John Gerarde, of London." 1st ed. 1597. (See South Lambeth.)

Established near the close of the 16th century.

Publication: Catalogus arborum, fruticum ac plantarum tam indigenarum, quam exoticarum, in horto Johannis Gerardi . . . nascentium. London, Hatfield. 1599. 22 p. This is stated to be the earliest known catalog of any one garden.

HULL

HULL BOTANIC GARDEN

Established: First Garden, June 3, 1812; New Garden, 1877.

Area: First Garden about 6 acres.

Directors:

First Garden, James C. Niven (Curator) (1853-?)

New Garden, Mr. Peake (Superintendent) (1877-?)

Historical Notes: Sheahan's *History of Hull* (1866) states that the first Botanic Garden "was, we believe, the second institution of the kind founded by a provincial town in this country; the first being that of Liverpool." One of the promoters was "Watson, the dendrologist." For many years the garden "maintained a high character for scientific excellence, but . . . the botanical character began gradually to disappear, and some twenty years ago [i.e., about 1846] was all but extinct." As late as 1866 the col-

lection of hardy herbaceous plants numbered above 2000 species arranged by families in beds, including "one of the largest collections of alpine plants in the country—numbering nearly 1000 species—each plant in a separate pot, neatly named and classified in their natural orders." Mr. Niven, the curator, came from Kew, and during the summer months he delivered three lectures a week in his capacity as Botanical Lecturer in the Hull School of Medicine. The lectures were given in a lodge just inside the entrance gate and opposite the curator's residence.

Mr. T. Sheppard, M.Sc., A.L.S., of Hull, and a personal friend of Mr. Peake, Superintendent of the new Garden, has been good enough to supply, in manuscript form, his personal recollections of the Hull Garden. The following quotations are from Mr. Sheppard's manuscript.

"One of my earliest recollections, which goes back over half a century, was attending a Fete at the Hull Botanic Gardens. . . . That was in the declining years of the Botanic Gardens as such, when the share holders had to adopt various popular means of increasing their income. . . . The Botanic Gardens were originally on the outskirts of the town, although now well in the center, and the street leading to them was named after the great botanist Linnaeus. . . . Later a plot of land outside Hull as it was then, was purchased, and known as the Botanic Gardens." This was the new Garden, 1877, referred to in the quotation that follows from the *Gardeners' Chronicle*. Nothing now remains of this Garden except the name "Botanic Gardens" for the station of the Hull and Withernsea Railway, the first from the center of the City. The Garden gradually lost its scientific character and became little more than an amusement park. Ultimately the site was sold and on it was built a large boys school, Hymer's College. All of the above information, including Mr. Sheppard's manuscript, was obtained through the good offices of Prof. R. D'O. Good, of the Department of Botany, University College, Hull.

The *Gardeners' Chronicle* for May 12, 1877 (p. 596) states as follows:

"The town of Hull was one of the first to establish a public garden for the instruction and recreation of its inhabitants, and the Hull Botanic Garden has long enjoyed a well earned reputa-

tion." The site became unfavorable owing to the growth of the City ("smoky atmosphere," etc.), and "the proprietors" decided to discontinue the Garden. In 1877 they purchased a new site. "The capital of the new company is proposed to be £30,000 in 3000 £10 shares." Besides recreational and horticultural features, "a goodly extent of ground is to be devoted to botanical purposes." A lecture hall, museum, and botanical library were part of the plan.

KEW
ROYAL BOTANIC GARDENS
Kew, Surrey

Established: 1841. *Area:* 288 acres.

Directors:

1. Sir William Jackson Hooker (1841–1865)
2. Sir Joseph Dalton Hooker (1865–1885)
3. Sir William Turner Thiselton-Dyer (1885–1905)
4. Lt. Col. Sir David Prain (1905–1922)
5. Sir Arthur William Hill (1922–)

Serves as a public park, open every day in the year, except Christmas Day. Hours: 10 a.m. to sunset, or 8 p.m. Plant houses open from 1 to 5 p.m.; Sundays to 6 p.m.; also mornings on Students' Days (Tuesdays & Fridays). Charge for admission 1 d. (6 d. Students' Days); free on Bank Holidays. *Source of income:* Government. *Library:* Reference, about 44,000 volumes. Current periodicals regularly received, approximately 700. *Herbarium:* About 5,000,000 specimens. *Arboretum and Fruticetum*, together: 7000 species and varieties. *Plantations* arranged systematically. Species and varieties under glass: 13,000. Herbaceous plants out of doors: 8000.

Publications:

Bulletin of Miscellaneous Information (Generally known as the "Kew Bulletin"). Ten numbers issued per year. The price of the annual volume at the present time (1938) is about 15 shillings, plus postage.

Official Guides to the Gardens and to the Museums of Economic Botany and North Gallery; Catalogue of Portraits of Botanists; Hand lists of the various classes of plants cultivated at Kew; Pictorial Postcards.

The above are published by His Majesty's Stationery Office,

and are obtainable from that Office, from the Curator of the Gardens, and (in the U. S. A.) from the British Library of Information, 270 Madison Avenue, New York, N. Y.

Other publications prepared at Kew include the following:

Hooker's Icones Plantarum. Contains figures with descriptions of new or rare plants, of which specimens are contained in the herbarium of the Royal Botanic Gardens, Kew. Edited by the Director for the Bentham-Moxon trustees. Each volume contains 100 plates. Issued in four parts. Price, 10s per part. Published by Dulau & Co. 29 Dover Street, London, W. 1.

The Botanical Magazine. Quarterly. Edited by the Director for the Royal Horticultural Society. Price 17/6 per part net; annual subscription 63/- net. Consists of hand-colored figures and descriptions of plants raised and flowered in the Royal Botanic Gardens, Kew, and other botanical establishments and private gardens. Published by Bernard Quaritch, Ltd. 11, Grafton St., New Bond Street, London, W. 1.

Index Kewensis Plantarum Phanerogamarum. Contains the names of all genera and species of Flowering Plants from the time of Linnaeus (1753) down to the present day, together with the names of authors, first place of publication, and geographical distribution of the plants concerned. Published by the Clarendon Press, Oxford.

Flora Capensis. Flora of Tropical Africa. Flora of British India. Flora of West Tropical Africa. The Cultivated Races of Sorghum.

Museums: The four museums of Economic Botany and the North Gallery (paintings of plants by Miss Marianne North) are open free daily (except on Christmas Day) from 1 to 5 p.m. or dusk. *Lectures:* No public lectures are given to school children or to the public, and living material for study is not supplied to schools. Museum duplicates of economic plant products are distributed free to schools to a limited extent. Instruction is confined to the courses for the training of young gardeners, including systematic botany, geographical botany, economic botany, and plant pathology. *Research Students* (other than staff): About 200 a year.

LIVERPOOL

LIVERPOOL BOTANIC GARDENS

Liverpool 7

Established: On present site, 1836. Previously on another site, 1802 to 1836. Under Liverpool Parks and Gardens Department. *Area:* 11 acres.

Directors:

1. John Shepherd (1802–1836)
2. Henry Shepherd (1836–1854)
3. Not known (1854–1863)
4. W. Tyerman (1863)
5. John Richardson (July, 1871–Nov. 1896)
6. James G. Guttridge (Nov. 1896–Dec. 1935)
7. Leo G. Godseff (June, 1936–)

Serves as a public park. Open free daily. *Source of income:* City Rates. *Library and Herbarium* removed to City Museum "some years ago." *Plantations:* Systematic. *Living study material* supplied to city schools.

LLANDUDNO

LLANDUDNO PUBLIC GARDENS

Town Hall, Llandudno, Carnarvonshire, North Wales

Established: 1910. *Area:* Approximately 350 acres.

Governors: Chairman and Pleasure Grounds Committee.

Superintendents:

1. A. C. Axtel (1910–1920)
2. G. Humphreys (1920–1925)
3. W. G. Robertson (1925–1934)
4. William Beresford Pritchard (1934–)

Serves as a public park. *Source of income:* Local rates. *Publications:* Hand Book of Plants grown. *Lectures* are given at the Gardens to school children. *Study collections* are loaned to schools.

LONDON

ROYAL BOTANIC SOCIETY'S GARDENS (*Discontinued*)

Established: 1838. The Society was granted a Royal Charter in 1839 and took over the site of the gardens the previous year.

Area: Nearly 20 acres.

Note: This Garden ceased to exist when the lease of the Gardens in Regent's Park expired, in April, 1932. Before this the following information was supplied; it now has historic interest.

Directors: Managed by a Council of Fellows of the Royal Botanic Society of London. The President of the Society (1932) was The Right Hon. The Viscount Lascelles, K.G., D.S.O.

Open every week-day to fellows and orders, from 9 a.m. until sunset; on Sundays at 9:30 a.m. Open to the public on Mondays and Thursdays on payment of one shilling. *Sources of income:* Fellows' subscriptions and entrance fees, and also by Parties, Tennis, and various minor sources. *Library:* Reference, 2000 volumes. Over 2000 pamphlets. Current periodicals received: 30. Devoted largely to economic botany, including agriculture and horticulture. *No regular herbarium.* *Arboretum:* Many fine, rare trees. *Plantations:* Herbaceous plants arranged in natural orders in students' garden; elsewhere arranged for ornament. Economic, medicinal, and kitchen gardens, and rock garden. *Species under glass:* Varied collection. *Publications:* *Masterly Summary*, succeeding the *Botanical Journal of the Royal Botanic Society*. Issued quarterly; offered in exchange; subscription, 1 shilling. Discontinued. *Museum:* Open free to all visitors to the gardens from 9 a.m. to 5 p.m. Contained important collection of economic plant products. *Lectures:* Free public lectures were given during the summer. *Living material*, including wild plants, was supplied to both public and private schools gratuitously, when requested. Throughout its history this Garden rendered extensive services to students, 600–800 students' tickets being issued annually as early as the 'eighties of the last century. *Practical Gardening School:* Established, 1897. A full course of instruction was arranged for three years, which aimed to give the pupils a practical insight into all the operations of gardening and horticulture. Diploma. "Lady gardening students" were first admitted in 1904 and reached a total of 22 in 1922. *The large Conservatory*, built in 1845, enclosed an area 220 feet long and 75 feet wide. Total area under glass was about 33,000 square feet. This is said (*Nature* 110. 185–187. Aug. 5, 1922) to be "the first large iron house built in England, the palm-house at Kew being constructed later."

NEWCASTLE-ON-TYNE

BOTANIC GARDEN (KINGS COLLEGE?)

No reply to our questionnaire.

OXFORD

OXFORD UNIVERSITY BOTANIC GARDEN

Department of Botany, Oxford University

Established: 1621 (By the Earl of Danby). *Area:* 5 acres.*Directors (Professors):**Custodians:*

- | | |
|--|--|
| | (John Tradescant, Jr., appointed, but never took office on account of his death in 1637 or 1638) |
| 1. Robert Morison (1669–1683) | Jacob Bobart, Sr. (1632–1679) |
| 2. Jacob Bobart, Jr. (1683–1719) | Tilleman Bobart? |
| 3. Edward Sandys (1720–1724) | |
| 4. Gilbert Trowe (1724–1734) | |
| 5. John Jacob Dill (Dillen, Dillenius) (1734–1747) | G. D. Ehret (1750–) |
| 6. Humphrey Sibthorp (1747–1784) | James Benwell (Gardener) (?) |
| 7. John Sibthorp (1784–1795) | |
| 8. George Williams (1796–1834) | J. Foreman (?–1812) |
| 9. Charles Giles Bridle Danberry (1834–1867) | William Baxter (1813–1851) |
| 10. Marmaduke Alexander Lawson (1868–1883) | |
| 11. Isaac Bayley Balfour (1884–1888) | William H. Baxter (1851–1887) |
| 12. Sidney Howard Vines (1888–1919) | |
| 13. Frederick Keeble (1920–1926) | W. G. Baker (1888–) |
| 14. Arthur George Tansley (1927–1937) | |
| 15. T. G. B. Osborn (1937) | |

Publication: Seed List (One of the first—circa 1685). *Open to the public daily* without charge. *The first greenhouse in England* was erected in this garden in 1734. The tercentenary was celebrated June 23, 1923.

READING

AGRICULTURAL BOTANIC GARDEN OF READING UNIVERSITY

The University, Reading, England

Established: 1918. *Area:* 2 acres.

Directors:

1. John Percival (1918–1932), who established the Garden
2. William B. Brierley (1932–)

Most of the Garden “is laid out in small plots separated by grass paths, the remainder being covered by two bird-proof cages, each of approximately 950 sq. yards in extent.

“The plots contain the chief forage plants and root crops of Western Europe, together with their wild prototypes. There are also plots of the commoner medicinal, dye, and oil plants which can be grown on farms in the British Isles.

“In the cages, about two thousand varieties of Wheat; all the species of *Aegilops*; and numerous varieties of Barleys and Oats are grown annually.

“The varieties of Wheat represent all the races and species of Wheat; these, and the *Aegilops* species were collected by Professor Percival from all parts of the world.

“The garden is of interest to agriculturists, and is invaluable for supplying material for classes in Agricultural Botany. It also enables students to study the agricultural plants in various stages of growth.

“There is a laboratory in the Garden which houses the collection of dried specimens of the cereals, and affords opportunity for research on the plants growing in the garden.

“An herbarium of the varieties of Wheat, and species of *Aegilops* is kept in the Agricultural Botany Department of the University.”

Admission free, by arrangement. *Source of income:* University funds. *Library* (of Department of Botany), 1000 vols., 30,000 pamphlets. *Herbarium:* About 2500 specimens. *Plantations:* Economic. *Publication:* Guide and List of Plants.

SOUTH LAMBETH (LONDON)

TRADESCANT'S GARDEN

Established, 1629, by John Tradescant, Senior, as a "Physic Garden," in South Lambeth, London, nearly opposite "Spring Lane" on the east side of the South Lambeth road between Stockwell and Vauxhall. Lysons (*Environs of London*, 1: 330) credits this Garden as "one of the first established in this Kingdom." Sir William Watson (*Philosophical Transactions of the Royal Society* 46: 160) states that Tradescant's Garden is, except that of John Gerard, author of the "Herbal," probably the first botanical garden in England. Watson listed a few of the plants still surviving in 1749. (See Holborn.)

UPTON (ENVIRONS OF LONDON)

HORTUS UPTONENSIS

Established: 1762. *Area*: About 5 acres.

Note: This garden was established by John Fothergill, a noted physician in London from 1740 until his death in 1780. It was considered at the time as one of the most important in England. The "Green-House" contained "upwards of 3400 distinct species of exotics" (Lettsom, *Memoirs of Fothergill*, p. 39). In the open "about 3000 distinct species of plants and shrubs." In co-operation with others Fothergill sent a collector to Africa, and secured plants "from all parts of the world." Many American trees he secured from the nursery of one Gray, who, with Peter Collinson, Mark Catesby, and other collectors, had the first nursery in England that specialized in North American trees and other plants. Hortus Uptonensis, located about four miles east of the boundary of the county of London, was gradually abandoned after the death of Fothergill.

WISLEY

ROYAL HORTICULTURAL SOCIETY'S GARDENS

Wisley, Ripley, Surrey, England

Established: 1904. *Area*: 60 acres.

Directors (Superintendents):

1. S. T. Wright (1904-1914)

2. Frederick William Keeble (1914–1919)
3. Frederick James Chittenden (1919–1931)
4. R. L. Harrow (1932–)

Open daily from sunrise to sunset, to fellows only, of the Royal Horticultural Society. *Sources of income*: Membership dues; private subscriptions. *Library*: Reference only. About 6000 volumes, including private library of Lindley. *Arboretum and Fruticetum*. *Publications*: *Transactions* (1805–1848); *Journal*, quarterly (1848–) free to fellows; *Schedule of Year's Arrangements*, issued the last week in January of each year; *Report of the Council*; Various Horticultural Pamphlets; Seed List. *Thirty free lectures* are given at the Garden each year. *Courses of instruction* are given daily at the Garden by members of its staff. *Note*: In 1914 this Garden was transferred from Chiswick to Wisley. S. T. Wright was the last Sup't. at Chiswick.

YORK

THE MUSEUM GARDENS

The Yorkshire Museum, York

Established: 1822. *Area*: 13 acres.

Director: The Keeper of the Museum.

W. E. Collinge (1921–)

Museum and Garden open daily, 9 a.m.–5 p.m. Admission, one shilling. Evenings 6d. Local schools free. *Source of income*: Yorkshire Philosophical Society. *Library*: 25,000 volumes. *Herbarium*: approximately 20,000. *Plantations* not classified. *Publication*: Catalog of British Plants in the Herbarium. *Occasional lectures* are given to school children. *Living plant material* supplied to local schools for study.

Greece

ATHENS (MODERN) (1)

BOTANIC GARDEN OF THE UNIVERSITY

(BOTANIKON ERGASTERION TOU ETHNIKOU PANEPISTEMIOU)
104 Solon Street

Established: 1835. *Area*: 5 acres.

Directors:

- | | |
|--------------------------------|------------------------------|
| 1. C. Fraas (1835–1848) | 4. S. Miliarakis (1893–1917) |
| 2. M. Orphanides (1849–1882) | 5. Jean Politis (1918–) |
| 3. Th. Aphentoulis (1883–1892) | |

Source of income: Budget of the University. *Library:* The common library of the Department of Botany, Botanic Garden, and Museum, 6000 volumes. *Herbarium:* "Contains all native plants of Greece and many others." *Plantations:* Systematic. *Museum:* Open free daily, 10–12 a.m.; 4–7 p.m. *Lectures to school children* are given occasionally, but no material is supplied to schools. *Note:* Theodore Heldreich was curator (Ephoros) of the Garden from 1851 to 1902.

ATHENS (ANCIENT) (2)

THE BOTANIC GARDEN OF ARISTOTLE AND THEOPHRASTUS

Established: About 340 B.C.

It is stated by several historians of general science and of botany, both ancient and modern, that Aristotle's garden, where he taught at Athens, was bequeathed by him to his pupil, Theophrastus. A careful study of the wills of both Aristotle and Theophrastus fails to confirm this.

In the *Life of Theophrastus* (Diogenes Laërtius. V. Bohn Ed. London, 1853. pp. 195–196) it is stated as follows: "It is said, too, that he [Theophrastus] had a garden of his own after the death of Aristotle, by the assistance of Demetrius Phalerius, who was an intimate friend of his." This has been interpreted (with other evidence?) that this garden was bequeathed to Theophrastus by Aristotle, but Aristotle's will (Diogenes Laërtius. V. Bohn Ed. pp. 185–186) makes no mention of Theophrastus except to name him as one of five "guardians of my children and of Herpyllis, and the trustees of all the property I leave behind me." The will appears to provide that, if Nicanor shall marry Aristotle's daughter the trustees shall turn the property over to him. "But if anything should happen to Nicanor, which may God forbid, either before he receives my daughter in marriage, or after he has married her, or before he has any children by her, then any arrangements which he may make by will shall stand. But, if Theophrastus, in this case, should choose to take my daughter in marriage, then he is to stand in exactly the same position as Nicanor." Laërtius does not say whether or not Theophrastus married the daughter of Aristotle and thereby acquired any of Aristotle's property.

Theophrastus mentions his garden several times in his will and

leaves it to such of his friends as "choose to hold a school" in it. The Greek text (and Latin translation in parallel columns) of the wills of Aristotle and of Theophrastus may be found in *Scriptorum Graecorum Bibliotheca*. Paris. 1862.

Haiti

DAMIEN

(Near Port-au-Prince)

Bureau de Botanique, Service National de la Production Agricole
et de l'Enseignement Rural, Port-au-Prince, Haiti

Director: Frederic Kebreau, Chief, Division of Botany and Plant
Pathology.

Note: Under date of March 6, 1937, we were informed as follows: "It is our plan to organize a small botanic garden at Damien, near Port-au-Prince. We are just assembling information and making plans, but the botanic garden is not yet established."

Hong Kong

HONG KONG

HONG KONG BOTANIC GARDENS

Superintendent, Botanical & Forestry Department, 1 Peak Road

Date opened: June 8, 1864. *Area:* 16 acres.

Directors:

- | | |
|---------------------------|---|
| 1. T. G. Donaldson (1861) | 5. Harold Green (1920) |
| 2. Charles Ford (1871) | 6. G. B. Twemlow, Acting Superintendent |
| 3. S. T. Dunn (1903) | |
| 4. W. J. Tutcher (1910) | 7. F. Flippance (1938-) |

Serves as a public park. Admission free, at all hours of the day. *Source of income:* Practically nil as of 1934. The garden is supported by governmental appropriations. *Library:* Approximately 2500 volumes. *Herbarium:* Approximately 40,000 specimens. *Publication:* Annual Report of the Botanical & Forestry Department.

Hungary

BUDAPEST

HORTUS BOTANICUS UNIVERSITATIS BUDAPESTINENSIS

Romanelli-utca 25, Budapest VIII

Established: 1771. *Area:* 4 hectares.*Directors:*

- | | |
|----------------------------|--------------------------------|
| 1. J. Winterl (1771–1810) | 7. F. Linzbauer (1862–1866) |
| 2. P. Kitaibel (1810–1816) | 8. L. Jurányi (1866–1897) |
| 3. J. Schuster (1816–1817) | 9. Sándor Mágócsy-Dietz (1897– |
| 4. C. Haberle (1817–1834) | 1928) |
| 5. J. Sadler (1834–1849) | 10. J. Tuzson (1928–) |
| 6. J. Gerenday (1849–1862) | |

Serves as a public park; open week-days 8 a.m. to 6 p.m.; Sundays 8 a.m. to 12 noon. Admission 10 fillérs. *Source of income:* Donation from the State. *Library:* 6353 volumes. *Herbarium:* 300,000 specimens. *Plantations:* Systematic, geographic, economic, ecologic. A small *Arboretum* and *Fruticetum*. *Publication:* Index Horti botanici Universitatis Budapestinensis. *Museum:* Hours are: 9 a.m. to 1 p.m. week-days, and from 3 to 6 p.m. on Sundays. Admission by permit of the Director. *Lectures for school children* are given. *Living material supplied* for study purposes to local schools. *Affiliations:* With the Institute for systematic Botany and Phytogeography, Péter Pázmány University.

DEBRECEN

BOTANIC GARDEN OF STEFAN TISZA UNIVERSITY

Director: R. de Soó.

Note: In 1935–1936 the new Botanic Garden was opened, including a systematic-morphologic section, Alpine Garden, Garden-laboratory, and greenhouses. *Publication:* Index Seminum.

SOPRON

BOTANICAL INSTITUT AND GARDEN OF THE ROYAL HUNGARIAN
JOSEPH UNIVERSITY OF TECHNICAL AND ECONOMIC
SCIENCES

Established: 1923. *Area:* 17 hectares.*Director:* Daniel Feher (1938).

Open daily. *Source of income*: Budget of the University. *Library*: 2500 volumes, 3000 pamphlets. *Herbarium*: 6000–7000 specimens. *Plantations*: Systematic, geographic. *Arboretum*. *Museum*: Open daily, 8 to 12 a.m.

SZEGED

BOTANICAL GARDEN OF THE FRANZ JOSEPH UNIVERSITY
(Egyetemi Fűvészkert)

Baross utca 2.I, Egyetemi Növénytani

Established: 1921. *Area*: 11.51 hectares.

Director: I. Györffy (1938).

Open free to the public daily, 7 to 12 a.m. and 2 to 7 p.m. *Source of income*: Governmental appropriations. *Plantations*: Geographic, economic. *Arboretum*. *Fruticetum*. *Publication*: Index Seminum. *Museum* (of the Botanical Institute): Open free to the public the first Sunday of each month, 10 to 12 a.m. *Special lectures* to school classes visiting the Garden. *Study material* supplied to schools.

India

BARODA

PUBLIC PARK

Established: 1880. *Area*: 1200 acres.

Directors (official title, Superintendent, State Gardens):

1. John M. Henry (1880–1893)
2. Gustav H. Krumbiegel (1893–1908)
3. B. F. Cavanagh (1908–1912)
4. T. R. Kothawala (1912–1932)
5. M. G. Desai (1932–)

Serves as a public park. Open free to the public daily, 6 a.m.–11 p.m. *Source of income*: State appropriations, and the sale of plants and seeds. *Library*: Small. *Arboretum and Fruticetum* reported as containing “lots of trees and shrubs.” *Plantations*: Ornamental and economic. *Publications*: Manual of Arboriculture and roadside planting; School Gardens (small book in vernacular); Seed List. *Museum*: Open free daily, except “half Sunday.” *Loan collections* for school use: Herbarium specimens, dried seeds, microscopic slides, economic plant products, and photographs. *Note*: Laxmi Villas and Makerpura, often referred to as “botanic gardens,” are only “Palace Ornamental Gardens” (under same management as given above).

BASSEIN (NEAR BOMBAY) (*Discontinued*)

BOTANICAL AND AGRICULTURAL STATION, BASSEIN

Established: 1906. *Area:* 90 acres.

Directors: 1. George Alexander Gammie (1906–1908) ; 2. William Burns (1908–1912)

Source of income: Annual appropriations by the national government, and sale of publications, plants, and seeds. *Library:* Reference only. *Plantations:* Systematic, economic. *Arboretum.* *Fruticetum.* *Publication:* Annual Report. *Note:* This garden was given up on April 1, 1912, and only a few men retained to keep the place in order until its future was definitely settled.

BANGALORE

GOVERNMENT BOTANIC GARDENS

Lal-Bagh, Bangalore

Established: 1874. *Area:* 117 acres.

Directors (Superintendent, Government Gardens in Mysore):

1. J. Cameron (1874–1908)
2. G. H. Krumbiegel (1908–1915)
3. L. Bishtopanth Badami (1915–1918) (Officiating)
4. H. C. Javaraya (1918–1919) (In charge)
5. G. H. Krumbiegel (1919–1925)
6. H. C. Javaraya (Feb. 9, 1925–April 15, 1925) (Officiating)
7. G. H. Krumbiegel (April 15, 1925–July 23, 1925)
8. H. C. Javarya (July 23, 1925–Jan. 31, 1928) (Officiating)
9. H. C. Javarya (1928–1932) (Confirmed)
10. M. K. Seetharama chetty (May 23, 1932–June 15, 1932)
(In charge)
11. H. C. Javaraya (June 15, 1932–Feb. 25, 1935)
12. M. K. Seetharama chetty (Feb. 25, 1935–Nov. 28, 1936)
(Sub-prottempore)
13. K. Nanjappa (Nov. 28, 1936–Feb. 12, 1937) (Officiating)
14. M. Narayana Reddy (Feb. 12, 1937–April 15, 1937) (Officiating)
15. L. S. Dorasami (April 15, 1937–) (Officiating)

Serves as a public park. Open free daily, 6 a.m. to 8 p.m.
Source of income: Government of His Highness the Maharaja of

Mysore. *Library*: 700 volumes, about 1000 pamphlets. *Herbarium*: About 3000 specimens. *Plantations*: Systematic, economic. *Arboretum*. *Fruticetum*. *Publications*: Report, Leaflets. *Museum*: Open free weekdays, 7 to 12 a.m. and 2 to 5 p.m. *Special lectures* are given to school children. *Living material* for study supplied to local schools. The Annual Report of the Government Gardens Department in Mysore, for the year 1936–37, states (p. 2) that “The Lal-Bagh at Bangalore . . . was extended on the west by the acquisition of some lands.” It is referred to as “a place of public resort besides being a center of botanical and horticultural information.”

BOMBAY

VICTORIA BOTANIC GARDENS

No reply to our questionnaire

CALCUTTA

ROYAL BOTANIC GARDEN, CALCUTTA

Sibpur, near Calcutta, British India

Established: 1787. *Area*: 273 acres.

Directors: (Superintendents)

1. Lt. Col. Robert Kyd, Founder (1787–1793)
2. William Roxburgh (1794–1814? Gage, l.c., gives 1813)
3. Francis Buchanan (afterwards Sir Buchanan Hamilton) (1814–16). *Fide* reply to our Questionnaire. A. T. Gage (Jour. Roy. Hort. Soc. **51**: 71–81. 1926) states that, “Between 1813 and 1817 H. T. Colebrooke, Francis Hamilton, Nathaniel Wallich, James Hare, and Thomas Casey successively held charge of the Garden, until in the latter year the Court of Directors finally appointed Wallich.”
4. Nathaniel Wallich (1817–1846); Absent at the Cape (1842–44)
5. William Griffith (Offg.) (1843–1846)
6. G. McClelland (Offg.) (1846–1848)
7. Hugh Falconer (1848–1855)
8. Thomas Thomson (1855–1861)
9. Thomas Anderson (1861–1868)
10. C. B. Clarke (Offg.) (1869–1871)

11. Sir George King (1871–1897) ; *fide* A. T. Gage, l.c.
12. Sir David Prain (1897–1905)
13. Lieut.-Col. A. T. Gage (1906–1923)
14. C. C. Calder (1923–1938, on leave prefatory to retirement)
15. K. P. Biswas (1938–)

Source of income: Total amount of the budget for the garden (1938) is: Rs 1,45,000/–, Botanical Survey of India—Rs 41,900/– and Cinchona Cultivation (Government of Bengal)—Rs 3,84,000/– Cinchona Cultivation (Government of India)—Rs 1,38,100/–—total Rs 6,95,531/–.

Library: There is an up-to-date library of the Botanical Survey of India in the Indian Museum. The Curator, Industrial Section, who mainly deals with applied botany, is also the librarian of the Botanical Survey of India.

A library is also maintained by the Royal Botanic Garden, consisting of 25,000 volumes and numerous pamphlets, which is chiefly meant for reference work and books are sent on loan to recognized botanists throughout India. This is said to be the oldest and best botanical library in India.

The Herbarium was started, since the foundation of this Garden, by Dr. William Roxburgh, the “Father of Indian Botany,” who was appointed the first official Superintendent of the then East India Company’s Garden, at present known as the Royal Botanic Garden, Calcutta, in 1793. The present damp-proof and fire-proof structure was erected by the late Sir George King in 1883. It is arranged in scientific order and contains a complete collection of dried specimens of the plants of the Indian Empire as also a fair collection of those of Asia outside India, and of Europe and Australia. The plants of Africa and America are far less perfectly represented. To the systematic botanist this well known herbarium is one of the best of its kind in Asia. Approximate number of specimens is about 2,500,000. Present curator, Mr. K. Biswas, M.A., has charge of the scientific part of the work and botanical exploration in different parts of the country. Loaning of specimens and exchange of herbarium materials are systematically carried on with botanists of different institutions all over the world.

Plantations: Geographical, containing fairly good representatives of the tropical plants of the world. The total number of trees and shrubs is about 1500. There is a large number of herbaceous specimens and grasses which are not counted. There are several ferneries, orchid houses and plant houses where valuable exotic palms, orchids and ferns are systematically cultivated. There is also a large nursery in which horticultural experiments

are carried on in a limited manner. A regular supply of plants and seeds is made to local people interested in horticultural gardening. Considerable exchange relations are carried on with the different botanic gardens of the world.

Publications: Scientific publications of the Royal Botanic Garden, Calcutta, as also of the Botanical Survey of India are: 1. The Annals of the Royal Botanic Garden, Calcutta, consisting of monographs of families and genera; 2. Shorter accounts of the botany of the different areas of India are published in the Records of the Botanical Survey of India; 3. The Annual Reports of the Royal Botanic Garden, Calcutta, Cinchona Cultivation in Bengal, and Botanical Survey of India are regularly published at the end of each year.

There is no arrangement for *public lectures* but instructions in arboriculture are given free of charge by the members of the staff to the officers of the Municipalities and Public Works and other Departments.

Note: The Administrative Head of this Garden is the Government of Bengal, Agriculture & Industries Department. The Officer-in-charge of the Garden is the Superintendent, Royal Botanic Garden, Calcutta. The Superintendent, Royal Botanic Garden, is also the Head of the Department of Cinchona Cultivation of the Government of Bengal and the Government of India, as also the Quinine Factory of the Government of Bengal. Under his charge are also the Lloyd Botanic Garden, Darjeeling, in the Sikkim Himalayas and a few other Calcutta Gardens.

The Royal Garden is again the headquarters of the Botanical Survey of India under the Government of India. The Superintendent of the Royal Botanic Garden, Calcutta, is ex-officio Director, Botanical Survey of India, under whose guidance and control the botanical explorations of the Indian Empire are carried on by his staff.

The Industrial Section of the Indian Museum is also under the Government of India and its control is under the Director, Botanical Survey of India. The Industrial Section of the Indian Museum is mainly the Museum of economic and applied botanical specimens.

Kyd advocated "establishing a botanical garden, not for the purpose of collecting rare plants (although they also have their uses) as things of mere curiosity or furnishing articles for the gratification of luxury, but for establishing a stock for disseminating such articles as may prove beneficial to the inhabitants as well as to the natives of Great Britain, and which ultimately may tend to the extension of the national commerce and riches"—an emphasis similar to that made by Sir Joseph Banks for Kew.

DARJEELING

LLOYD BOTANIC GARDEN

c/o Royal Botanic Garden, Calcutta

This Garden is at Darjeeling, Sikkim Himalayas. See Note at end of Calcutta.

Superintendent: K. P. Biswas (1938—)

Area: 45 acres. *Plantations* contain a collection of Eastern Himalayan plants. Attempts are also made to grow temperate and alpine species. *Herbarium*: Rich in Sikkim plants. *Library*: At the Royal Botanic Garden, Calcutta. (See Calcutta, *Note*.)

KIRKEE

GANESHKHIND FRUIT EXPERIMENT STATION

(GANESHKHIND BOTANICAL GARDEN)

Kirkee, Poona District, Bombay

Established (Re-established): 1904. *Area*: 80 acres.

Directors: G. A. Gammie (1904–1908); William Burns (1908–1921); G. S. Cheema (1921—).

Serves as a public park. Open free daily, from sunrise to sunset. *Source of income*: Annual appropriations by the national government; sale of publications, plants, seeds, flowers, bouquets, "greenery," etc. *Library*: Reference, small. *Plantations*: Systematic, economic. *Arboretum*. *Fruticetum*. *Publication*: Annual Report. *Living material*, including wild plants, is supplied to schools for study. *Affiliations*: The Station is attached to the Agricultural College, Poona, which is affiliated with the University of Bombay.

OOTACAMUND

GOVERNMENT BOTANIC GARDENS

Ootacamund, P. O., the Nilgiris, South India

Established: 1847. *Area*: About 51 acres.

Directors (Curators): F. H. Butcher (?–19 February, 1936); P. A. Nathan (20 February, 1936—).

Serves as a public park. Open free daily, sunrise to sunset. *Source of income*: Government; sale of plant material. *Library*: 800 volumes, pamphlets, and bulletins. *Plantations*: Systematic; ornamental. *Publication*: Catalog of plants for sale. *Supplies living plant material* to schools for study.

POONA

EMPRESS BOTANICAL GARDENS

Poona, Bombay

Superintendent: P. S. Kanetthar (1913); N. M. Bhagawat (1938).

Area: 60.37 acres. *Serves as a public park.* Open free daily, from sunrise to sunset. *Source of income:* Annual grants by the national government, and the sale of flowers, fruits, plants, seeds, etc. *Plantations:* Not formally divided into sections, but a small area (5.7 acres) is specially devoted to plants of botanical interest. *Publication:* Annual Report. *Educational Work:* Demonstrations in budding, grafting, and other garden operations are given to students of the local government station college, and schools, and to civilians and private cultivators. Study material is supplied, when requested, to schools and colleges. *Affiliation:* Government Agricultural College; Agri-Horticultural Society of Western India.

SAHARANPUR (SEHARUNPUR; SHAHJAHANPUR)

GOVERNMENT BOTANIC GARDENS

Saharanpur, United Provinces, India

Established: 1779. *Area:* 168 acres.

Directors (or Superintendents):

1. Under Pre-British Government (1779–1817)
2. George Govan (1817–1823)
3. John Forbes Royle (1823–1831)
4. Hugh Falconer (1831–1842)
5. William Jameson (1842–1876)
6. G. F. Luthrie (1876–1887)
7. William Gollan (1887–1904)
8. H. M. Leake (1904–1906)
9. Amos C. Hartless (1906–1919)
10. R. Badgery (1920–)

Serves as a public park. Open free daily, from sunrise to sunset. *Source of income:* Annual appropriations by the national government. *Library:* Reference. About 500 volumes and 250 pamphlets. *Herbarium:* Of garden plants only. About 1000 specimens. *Plantations:* Economic. *Arboretum.* *Fruticetum.* *Publications:* Annual Report. Established, 1841. *Bulletins* (occasional). *Note:* The gardens were formerly entirely botanical, subsequently chiefly commercial, and now partly scientific and partly commercial. There is a branch garden at Dehra Dun. *Affiliated* with School of Horticulture.

Indochina

HANOÏ

JARDIN BOTANIQUE ET D'ACCLIMATATION DE HANOÏ

École Supérieure d'Agriculture et de Sylviculture de l'Indochine

Established: September 3, 1889. On March 21, 1918 it was given over, in great part, to the municipality for a public garden, and the experimental plots to "l'École supérieure d'Agriculture et de Sylviculture de l'Indochine"; thus it is now partly just a public park and partly scientific. *Area:* 20 hectares in the beginning.

Directors:

September 3, 1889, M. J. Martin

November 8, 1896, M. Ch. G. Lemarie, Agronomical Engineer

November 9, 1901, M. L. Jacquet

December 1, 1907, M. E. Lafitan

March 7, 1910, M. Ch. G. Lemarie, Agronomical Engineer, Director of Agricultural & Commercial Services of Tonkin

January 1, 1915, M. Breymann, in charge of carrying on business during the mobilization of the Director as "Officier de Complement."

April 8, 1938, M. Chaucot

The Garden serves now only as a public park. Admission free at all times. *Source of income:* The municipal budget. *Arboretum:* Many of the trees died during the World War. *Plantations:* No longer any general labelling system. The classification was formerly systematic. *Affiliation:* That part of the Garden given over to l'École Supérieure d'Agriculture et de Sylviculture for experimental plots is now connected with the Université Indochinoise, of which this school is a part.

SAÏGON

JARDIN BOTANIQUE ET ZOOLOGIQUE DE SAÏGON

Established: 1864, as both a commercial and a scientific institution. *Area:* 30 hectares.

Directors:

1. M. Germain (1864–1865)

2. L. Pierre (1865–1877)

3. Corroy

4. Christian Horace Bénédict

Alfred Moquin-Tandon

5. J. Martin

- | | |
|-----------------------------|-----------------------------|
| 6. Ed. Brousmiche | 12. Robin (1924) |
| 7. Jacquet | 13. A. Neveu (1924–1930) |
| 8. E. Haffner (1897–1909) | 14. L. Anglès (1930–1932) |
| 9. Paul Morange (1909–1918) | 15. H. Balencie (1932–1934) |
| 10. Magen (1919–?) | 16. M. Lelarge (1934–1937) |
| 11. Devraigne (1923) | 17. L. Feunteun (1937–) |

Open free, daily, at all hours. *Source of income*: Governmental appropriations; receipts from sale of plants and seeds. *Library*: Small; reference only. *Herbarium*: More than 10,000 specimens. *Arboretum de Trang-Bôm* (q.v.): About 2000 species. *Fruticetum*: More than 200 species. *Plantations*: Besides the garden proper, there are nurseries, propagating beds, and large experimental plots, which are part of the "Service Économique." *Publications*: 1. "Catalogue des plantes existantes au Jardin Botanique et à la Ferme expérimentale des Mares," by Corroy. 2. Énumération des végétaux à l'étude en Cochinchine (La Cochinchine en 1878). 3. General catalogue of classified plants in the Jardin Botanique de Saïgon. 4. Catalogue of seeds for exchange. 5. "Le Caoutchouc de plantation," P. Morange. 6. "La culture de l'Hévea et du Cocotier," P. Morange. 7. "Les Travaux secondaires d'hydraulique agricole," J. Robin. 8. "Catalogue des plantes du Jardin Botanique de Saïgon" by Aug. Chevalier. 9. Essays published in the Bulletin Économique and in the Bulletin Agricole de l'Institut Scientifique de l'Indochine. *Special lectures* in horticulture and gardening. *Study Material*: The garden is prepared to furnish such study material to schools as they demand. *Affiliation*: Le Jardin Botanique de Saïgon is affiliated with the Institut Scientifique de l'Indochine.

TRANG-BÔM

ARBORETUM DE L'INSTITUT DES RECHERCHES AGRONOMIQUES
ET FORESTIÈRES DE L'INDOCHINE

Province of Biên-hoà

Ireland (Eire)

CORK

BOTANIC GARDEN OF UNIVERSITY COLLEGE

University College

Established: 1877. *Area*: over 2 acres.

Directors:

1. Marcus Hartog (1877–1921)

2. H. A. Cummins (1921–1932)
3. J. C. Sperrin-Johnson (1932–)

Open to visitors, Monday to Friday, 9 a.m. to 6 p.m.; Saturday, 9 to 12; closed on Sundays. *Source of income*: The College budget. *Library*: "Several thousand." *Herbarium*: "Many thousand." Native and foreign, especially lichens. *Plantations*: Systematic, ecologic (rockeries, water and bog gardens), medicinal. *Arboretum* ("several acres"). *Fruticetum* (small). *Conservatories*. *Publication*: Seed List.

DUBLIN

TRINITY COLLEGE BOTANIC GARDENS

Shelbourne Road, Ball's Bridge

Established: 1806. *Area*: 8 acres.

Directors:

1. James Townsend Mackay (1806–1855)
2. John Bain (1855–1866; 1873–1874)
3. Alexander Dickson (1866–1869)
4. Edward Percival Wright (1869–1873)
5. Michael Dowd (1874–1876)
6. John McKenzie (1876)
7. Frederick William Moore (1876–1879)
8. Frederick William Burbridge (1879–1905)
9. Henry Horatio Dixon (1905–)

Source of income: Trinity College, Dublin. *Library*: That of Trinity College. *Herbarium*: 200,000 specimens. *Plantations*: Systematic. *Arboretum*. *Publication*: Seed List. *Study material*: Living specimens of both wild and cultivated plants are supplied to schools occasionally when requested.

GLASNEVIN, DUBLIN

THE BOTANIC GARDENS

(Garraí Na Lus)

Glasnevin, Dublin, N.W. 3

Established: 1794. *Area*: 51 acres.

Directors: (*Curator*, 1794–1877; *Keeper*, 1877–)

1. Walter Wade (1794–1825)
2. Samuel Litton (1826–1834)

3. Ninian Neven (1834–1838)
4. David Moore (1838–1879)
5. Sir Frederick William Moore (1879–1922)
6. John W. Besant (1922–)

Serves as a public park. Open free, daily, from 10 a.m. to 7 p.m. or dusk; Sundays from 11 a.m. *Source of income:* Annual vote of Parliament. *Library:* About 5000 volumes and pamphlets. *Herbarium:* Approximately 15,000 specimens, including the “Augustine Henry” Forestry Herbarium. The main National Herbarium is under the Department of Education and is included in the Natural History Department of the National Museum. There is an *Arboretum* and a *Fruticetum*. *Plantations:* Systematic, Rock Garden, Rose Garden, Herb Garden. *Publications:* Seed List (Liosta Síolta le Malartú); The Botanic Gardens: Origin, History, and Development (Reprint from the Dept. of Agr. Journal 33: No. 2, 1936). Does not supply living material for study to local schools, but only to Colleges and Higher Grade Schools (National University, Royal College of Surgeons, and others).

Italy

BOLOGNA

R. ISTITUTO ED ORTO BOTANICO DELL' UNIVERSITÀ DI BOLOGNA
Via Irnerio 42

Established: 1567. *Area:* 1 hectare.

Directors:

1. Ulisse Aldrovandi (1567–1605)
2. Gio. Cornelio Uterwer (Uterverius) (1605–1620)
3. Bartolomeo Ambrosini (1620–1657)
4. Giacinto Ambrosini (1657–1665)
5. Gio. Battista Capponi (1665–1676)
6. Lelio Trionfetti (1686–1722)
7. Giuseppe Monti (1722–1760)
8. Gaetano Monti (1760–1792)
9. Luigi Rodati (1792–1802)
10. Filippo Re (1802) (Suddenly resigned)
11. Giosuè Scannagatta (1803–1815)
12. Antonio Santagata (acting) (1816)
13. Antonio Bertoloni (1817–1869)
14. Giuseppe Bertoloni (1869–1878)

15. Giuseppe Gibelli (1879–1883)
16. Federico Delpino (1884–1893)
17. Oreste Mattiolo (1894–1897)
18. F. Morini (1897–1927)
19. V. Peglione (1927–1929)
20. L. Buscalioni (1929–1936)
21. E. Chiovenda (1937–)

Open to the public daily. *Source of income*: Governmental appropriations. *Library*: 3000 volumes. *Two Herbariums*: Herbarium A. Bertoloni, and Herbarium Caldesi. *Plantations*: Systematic according to the Engler System. *Arboretum*. *Publication*: "Malpighia." *Museum*: Open free daily. *Study collections* are loaned to schools. The Garden also *supplies living material* for study to schools. *Note*: Luca Ghini, the great teacher of botany, lectured on simples at Bologna from 1534 to 1544, but, as Meyer states (Gesch. Bot. 4: 257), "without the help of a garden."

CAGLIARI

R. ORTO BOTANICO DI CAGLIARI

Viale Fra' Ignazio da Laconi, N. 11, Cagliari (Sardinia)

Established: First established in 1765, then completely abandoned. Giovanni Meloni-Baille, professor of natural history at the University, agitated for its reestablishment in 1851, and his successor again in 1858, but it was not actually reestablished until 1864 (1868?).

Directors:

1. Patrizio Gennari (1866–1892)
2. Domenico Lovisato (acting) (1893–1898)
3. Fridiano Cavara (1899–1900)
4. Saverio Belli (1901–1908)
5. Ermanno Giglio-Tos (acting) (1909)
6. Flaminio Tassi (acting) (1910)
7. Leopoldo Nicotra (1911–1914)
8. Giuseppe Falqui (acting) (1915–1920 e 1922–1924)
9. Giuseppe Gola (1921)
10. Giovanni Negri (1925)
11. Giuliano Mameli-Calvino (1926–1929)
12. Renato Pampanini (1930–)

Plantations: Systematic.

Affiliation: Istituto Botanico della R. Università.

CAMERINO

ORTO BOTANICO DELL' UNIVERSITÀ

Established: 1825. *Area:* About 6000 square meters.

Note: At the beginning of the 19th century a simple mountaineer collected the plants necessary for the botanical classes at the University. In the reign of Leone XII there was instituted the real botanic garden about 1825. Agostino Reali reorganized the garden and erected the greenhouses.

Directors:

1. Vincenzo Ottaviani (1826–1841)
2. Mariano Gajoni (1841–1850)
3. Agostino Reali (1850–1882)
4. Raniero Reali (1882–1894)
5. Augusto Napoleone Berlese (1894–1899)
6. Giovanni Battista De Toni (1899–1901)
7. Alberico Benedicenti (1901–1903)
8. Filippo Fodera (1903–1905)
9. Domenico Filippi (1905–1932)
10. Gennaro Teodoro (1932–1936)
11. Antonio Mazzaron (1936–)

Serves as a public park. Open free daily, 8 a.m. to 5 p.m., May 1–September 30. *Library:* 300 volumes. *Herbarium:* 1500 specimens. *Plantations:* Systematic, according to the system of Linnaeus. *Arboretum.* *Publication:* Delectus Seminum. In 1938 the systematic part of the Garden assumed greater importance by the establishment in the University of a Faculty of Natural and Biological Science. The Garden is used by the students of pharmacy, and has a botanical laboratory.

CATANIA

ORTO BOTANICO UNIVERSITARIO

Via Etnea 397, Catania (Sicily)

Established: 1847.

Directors: Francesco Tornabene (1847–1892); Pasquale Baccarini (1892–?); R. Savelli (1936).

FERRARA

ISTITUTO ED ORTO BOTANICO DELL' UNIVERSITÀ

Via Paradiso

Established: 1771. *Area:* 1/2 hectare.*Directors:*

1. Giuseppe Parolini (1771–1794)
2. Francesco Maria Giacomini (1795–1801)
3. Giacomo Andreasi (1802–1803)
4. Antonio Campana (1803–1832)
5. University closed (1803–1815)
6. Garden attached to Lyceum
7. Francesco Jachelli (1832–1862)
8. Domenico Jachelli (1862–1878)
9. Carlo Massalongo (1878–1918)
10. Augusto Beguinot (1918–1920)
11. Emilio Cavazzani (1920–1922)
12. Eugenio Baroni (1922–1930)
13. Roberto Savelli (1930–1931)
14. Luigi Buscaglioni {
15. Carlo Cappelletti { (1931–1932)
16. Felice Gioelli (1932–)

Source of income: Governmental appropriations. *Library:* About 1200 volumes. *Herbarium:* About 500 specimens (specially the flora of Ferrara). *Plantations:* Systematic.

FLORENCE (FIRENZE) (1)

GIARDINO DEI SEMPLICI (Also, GIARDINO DELLE STALLE)

Via Lamarmora 4

Established: December 1, 1545. (Volpi, G.: *Intorno all' origine del "Giardino dei semplici" di Firenze*. Firenze, 1928. Ed. Olschki.)

Note: Cosimo I entrusted the foundation of this Garden to Luca Ghini, who was also the first director of the Garden at Pisa (Summer 1543). About 1557 it was known as a "garden of simples in the vicinity of San Marco." After a period of neglect it was flourishing again in 1718, under the care of the Botanical Society of Florence. In 1737 a portion of the Boboli Garden was annexed,

and the old Botanic Garden of San Marco became again a garden of simples. In 1783 it was transformed into an agricultural experiment garden. In 1883 the agricultural experiment garden became again an educational botanic garden, and shortly thereafter the botanical museum of Boboli was moved to the San Marco building.

Directors:

1. Giovanni Targioni-Tozzetti (1737–1749)
2. Saverio Manetti (1749–1782)
3. Attilio Zuccagni (1782–1806)
4. Ottaviano Targioni-Tozzetti (1807–1829)
5. Filippo Parlatore (1842–1877)
6. Odoardo Beccari (1878–1879)
7. Teodoro Caruel (1880–1896)
8. Eugenio Baroni (acting) (1896–1897)
9. Oreste Mattiolo (1897–1900)
10. Pasquale Boccarini (1900–1919)
11. Gino Bargagli-Petrucci (acting) (1919–1922)
12. Enrico Carano (1922–1925)
13. Giovanni Negri (1925–)

Serves as a public park. Open daily. *Source of income:* Comune of Florence and the R. University. *Library:* About 50,000 volumes. *Herbarium:* About 500,000 sheets. *Plantations:* Systematic. *Museum:* For students only. *Affiliation:* R. Università degli Studi.

FLORENCE (FIRENZE) (2)

RR. ARBORETI SPERIMENTALI DI VALLOMBROSA

Vallombrosa, Prov. Firenze

Established: 1869. *Area:* 9 hectares.

Directors:

1. Bérenger (1869–1885)
2. Giovanni Carlo Siemoni e Vittorio Perona (1886–1912)
3. Lodovico Piccioli (1913–1922)
4. Aldo Pavari (1923–)

Open free on request. *Source of income:* Appropriations by the State. *Library:* That of the Regia Stazione Sperimentale di Selvicoltura. *Herbarium:* About 1000 specimens. *Arboretums:* Two. *Fruticetum:* About 3000 species of woody plants.

GENOA

ORTO BOTANICO DELLA R. UNIVERSITÀ DI GENOVA

Corso Dogali 1-B

Established: 1803.*Directors:*

1. Domenico Viviani (1803–1837)
2. Agostino Sassi (1837–1839, interim)
3. Giuseppe de Notaris (1839–1872)
4. Francesco Baglietto (1873–1875, interim)
5. Federico Delpino (1875–1884)
6. Francesco Baglietto (1885–1886, interim)
7. Ottone Penzig (1886–1929)
8. Augusto Béguinot (1929–)

Source of income: Annual appropriations by the national government. *Library:* Reference only. Number of volumes ("very large"), not known. Current periodicals received: 80. *Herbarium:* Number of specimens (very large) not known. *Plantations:* Chiefly systematic. An annex has been recently created for genetic researches. *Publications:* There is no official publication, except *Delectus Seminum*. The Director publishes "Archivio Botanico per la Sistematica, Fitogeografia, e Genetica," and "Archivio Botanico" (2^a ser.) at his own expense. *Museum:* Open daily, 9 a.m.–5 p.m. *Lectures* on botany are given in the museum to students of medicine, pharmacy, and natural science of the University of Genoa. *Living material* for study is supplied occasionally when requested, to local public and private schools. *Note:* The building for the Botanical Museum (including museum, lecture room, laboratories, library, and residence of the director), was erected on the grounds of the Garden in 1892, as a gift from Sir Thomas Hanbury. It was inaugurated at the International Botanical Congress, September 6, 1892, and is officially named "Istituto Botanico Hanbury."

LUCCA

ORTO BOTANICO DELL' UNIVERSITÀ

Established: 1819.*Directors:*

1. Paolo Volpi (1819–1833)
2. Benedetto Puccinelli (1833–1850)

3. Attilio Tassi (1850–1860)

4. Cesare Bicchi (1860–?)

Publications: Indices Seminum (1851; 1858)

MESSINA

ORTO BOTANICO

Piazza XX Settembre

Founded: About 1638–1640. *Note:* Pietro Castelli, the first director, founded this Garden between 1638 and 1640. It was suppressed and in decay from 1657 to 1886. Antonio Barzi, appointed professor of botany at Messina in 1879, reestablished the Garden beginning about 1884.

Directors:

1. Pietro Castelli (1638–1656)

Garden abandoned (1657–1886)

2. Antonio Borzi (1886–1892)

3. Fausto Morini (1892–?)

4. G. E. Mattei (?–?)

5. Leopoldo Nicotra (1909)

MILANO

ORTO BOTANICO DI BRERA

Via Brera 18

Established: 1781.

Directors:

1. Fulgenzio Vitman (1781–1800 circa)

2. Pietro Pratesi (c. 1800–1806)

3. Filippo Armano (1806–1817)

4. Pietro Armano (custodian) (1818–1820?)

5. Giuseppe Acerbi (1817–1826)

6. Giuseppe Balsamo-Crivelli (1826–1852)

7. (Various professors of the Lyceum Brera and of the R. Istituto Superiore Agrario) (1853–1870)

8. Francesco Ardissoni (1871–?)

9. Ugo Brizi (1937)

Note: Established by Vitman in affiliation with the Lyceum of Brera to aid in the teaching of officinal botany. In 1864 it became affiliated with the R. Istituto Superiore Agrario.

MODENA

REGIO ISTITUTO E ORTO BOTANICO DELLA R. UNIVERSITÀ DI
MODENA

Viale Regina Margherita

Established: 1772, by Duke Francesco III d'Este. *Area:* About 3 hectares.

Directors:

1. Gaetano Rossi (1772–1775)
2. Robert Francesco de Laugier (1776–1783)
3. Guiseppe Maria Savani (1783–1798)
4. Francesco Maria Savani (1798–1804)
5. Bonaventura Corti (1805–1809)
6. Marco Antonio Tamburini (1810–1812)
7. Bartolomeo Barani (1812–1814)
8. Filippo Re (1814–1817)
9. Giovanni de Brignoli de Brunnhoff (1818–1856)
10. Ettore Celi (1856–1873)
11. Giuseppe Manzini (1873–1874)
12. Giuseppe Gibelli (1874–1879)
13. Giuseppe Manzini (acting) (1879–1880)
14. Romualdo Pirotta (1880–1883)
15. Antonio Mori (1883–1902)
16. Giovanni Battista De Toni (1902–1924)
17. Augusto Béguinot (1924–1929)
18. Emilio Chiovenda (1929–1935)
19. Giorgio Negodi (1935–)

Open free to the public only on Royal Statute Day, and on the birthdays of the King and Queen of Italy, from 10 a.m. to 3 p.m. *Library:* Reference. Only for students in the Institute. Pamphlets: About 1400. Current periodicals received: 12. *Herbarium:* 67,000 specimens (18,000 species). *Plantations:* Systematic. *Arboretum:* Coniferae, 81 species: other trees, 10 species. *Fruticetum:* 300 species. *Species under glass:* 2192. *Herbaceous plants out of doors:* 1980. *Publication:* Delectus Seminum (irregularly since 1818). *Museum:* A small one, open whenever the Garden is open. *Study collections* of herbarium specimens and dried seeds are loaned to schools.

NAPLES

REALE ORTO BOTANICO DELLA R. UNIVERSITÀ

Via Fiora

Established: 1810. (1807?) *Area:* 13 ha.*Directors:*

1. Michele Tenore (1810–1860)
2. Guglielmo Gasparrini (1861–1866)
3. Giuseppe Antonio Pasquale (ad interim) (1866–1867)
4. Vincenzo Cesati (1868–1882)
5. G. A. Pasquale (1883–1893)
6. Federico Delpino (1893–1905)
7. Fridiano Cavara (1906–1929)
8. Biagio Longo (1929–)

Open free, with a permit, to the public on week days (except holidays), from 9 a.m. to 11:30 a.m., 3 to 4:30 p.m. Source of income: State appropriations. *Library:* Reference only. About 1500 volumes and 5000 pamphlets; 110 current periodicals received. *Plantations:* Arboretum (the largest section), fruticetum, systematic, geographic, economic, school demonstration plants. *Publication:* "Bullettino dell'Orto Botanico della R. Università di Napoli," established 1898. Offered in exchange. Subscription price 150 lire. *Herbarium:* Tenoreanum, Gussonianum, etc. *Instruction:* Regular courses are given in general botany, pharmaceutical botany, plant physiology, and medical botany (demonstrations). To the Garden is annexed the "Stazione Sperimentale per le Piante Officinali," founded in 1928. *Note:* Toward the end of 1662 there existed a pharmaceutical garden (of simples) called the Montagnolo Garden, in charge of the religious house of SS. Annunziata. Professor Petagna, the predecessor of Michele Tenore, kept a small part of the Mt. Olivet garden planted for instructional use. The real botanic garden was authorized in 1796, but not actually established until 1809 under M. Tenore. (Saccardo, P. A. *La Botanica in Italia*. Venice. 1895.)

PADOVA (PADUA)

ORTO BOTANICO DELLA R. UNIVERSITÀ DI PADOVA

Via Orto Botanico 15

Established: 1545. *Area:* About 5 acres (20,664 sq. meters).

Claimed to be the first Botanic Garden for didactic purposes. The Garden was established by a decree of the Senate of the Re-

public of Venice enacted June 29, 1545, on the proposal of Francis Bonafede, who first conceived and urged the idea in 1543. Ten years earlier (1533) the same scholar, Professor of Medicine at the University of Padua, proposed and secured the establishment there of the professorship of simples (*Lectura Simplicium*). This chair, the first professorship of botany in Europe, was founded by a decree of the Venetian Senate, and Bonafede was made the first professor. The Botanic Garden was established primarily to meet the need which Bonafede felt of illustrative material to enrich his lectures.

Directors:

1. Luigi (Aluigi) Squalermo (called Anguillara) (1546–1561)
2. Melchiore Guilandino (1561–1589)
3. Giacom' Antonio Cortuso (1590–1603)
4. Prospero Alpini (Alpino) (1603–1616)
5. Giovanni Prevostio (Prevost) (1616–1631)
6. Giovanni Rhodio (suddenly resigned) (1631)
7. Alpino Alpini (1631–1637)
8. Giovanni Veslingio (Wesling) (1638–1649)
9. Giorgio Dalla Torre (1649–1681)
10. Jacopo Pighi (1681–1683)
11. Felice Viali (1683–1719)
12. Giulio Pontedera (1719–1757)
13. Pietro Arduino (Acting) (1757–1760)
14. Giovanni Marsili (1760–1794)
15. Giuseppe Antonio Bonato (1794–1835)
16. Roberto De Visiani (1836–1878)
17. Pier' Andrea Saccardo (1878–1915)
18. Augusto Béguinot, acting (March 1, 1916–Oct. 15, 1921)
19. Giuseppe Gola (Oct. 16, 1921–)

Open free daily. Source of income: The State. *Plantations:* Herbaceous plants. *Arboretum. Fruticetum. Library:* More than 18,800 volumes; 25,000 pamphlets. Founded in 1770 by Giovanni Marsili. Contains one of the largest known collections of portraits of botanists (more than 600), begun by De Visiani and continued by Saccardo. Includes Saccardo's personal mycological library of 300 volumes and some 7000 pamphlets, and A. Forti's personal algological library of 150 volumes and 9000 pamphlets. *Herbarium:* Initiated at the beginning of the 19th century by Bo-

nato. 1. General, more than 100,000 specimens; 2. Dalmatian flora, 10,000; 3. Venetian flora, more than 100,000 specimens (3500 species). 4. Cryptogamic, comprising the personal herbarium of Saccardo of more than 69,000 specimens and 18,500 species; and the personal algological Herbarium of A. Forti (Verona) of 100,000 specimens and 20,000 species. *Affiliation*: University of Padua. *Publication*: Semina, Sporae, Bulbi, et Tuberi quae Hortus Botanicus Patavinus Pro Mutua Commutatione Offert. *Note*: Bonafede is said to have had a garden of simples at Padua as early as 1533, which was financed by the Venetian Senate. Instruction of students began there in 1540. The present Garden is nearly surrounded by the Alicorno Canal which, since 1575, has supplied water for irrigation and for some seventeen fountains.

PALERMO (1)

ORTO BOTANICO DELLA R. UNIVERSITÀ

Via Lincoln

Established: 1779

Directors:

1. Giuseppe Tineo-Ragusa (Porta Carini) (1780–1789)
2. Giuseppe Tineo-Ragusa (Villa Giulia) (1789–1812)
3. Vincenzo Tineo (1812–1856)
4. Agostino Todaro (1857–1892)
5. Antonio Borzi (1892–1921)
6. Luigi Buscalioni (1923–1928)
7. Luigi Montemartini (1928–)

Note: Saccardo (l. c.) states that in 1779 Eutichio Barone and Giuseppe Tineo-Ragusa planted a small garden near the fortification of Porta-Carini, Palermo, but that the actual botanic garden, near the Villa Giulia, was not inaugurated until 1789 under the direction of Tineo-Ragusa. A letter from the present (1938) director gives 1780 as the beginning date for G. Tineo-Ragusa.

PALERMO (2)

R. GIARDINO COLONIALE "A. BORZI"

Established: 1913. *Area*: 3 acres, experimental fields.

An agricultural garden. Address and directors the same as 5–7 for Palermo (1) q.v. *Publications*: Bollettino. Seed List.

PALLANZA

VILLA TARANTO BOTANIC GARDENS

Villa Taranto, Pallanza (Lago Maggiore)

Established: 1931. *Area:* 200 acres.*Director:* Henry R. Cocker (1934—).

Projected: Rock Garden of several acres; Rose Garden with space for 5000 shrubs; Water Garden. *Note:* Privately owned by Capt. N. McEacharn, and still (1937) under construction. The present intention is to present this garden eventually to the Italian nation. Work has been greatly hindered by the Italo-Abyssinian war and resulting "sanctions." Present personnel of 40 is only about one-third of what it would be in normal times. "No plants, seeds, or bulbs may be imported from 'sanctionist' countries. No British periodicals may be received, including horticultural journals, and foreign seed and plant catalogs" (1937). There is a training course for gardeners. *Publication:* Seed List.

PARMA (1)

ORTO DEI SEMPLICI (*Discontinued*)*Established:* About 1599.*Directors:*

1. Pompilio Tagliaferri (1600?–1639)
2. Lorenzo Porta (1639–?)
3. Ant. M. Bacicalue (1705–1738)
4. Position vacant (1738–1749)
5. Silvestre A. Ponticelli (1749–1769)

Note: The present Botanic Garden at Parma is the successor of this earlier "Garden of simples." See Parma (2).

PARMA (2)

ORTO BOTANICO DELLA REGIA UNIVERSITÀ

Strada Farini 90

Established: 1770. *Area:* About three acres.*Directors:*

1. Giovanni Battista Guatteri (1769–1793)
 2. Bartolomeo Barbieri (ad interim) (1793–1795)
 3. Diego Baldassare Pascal (1795–1802)
- (Closed "for political reasons," 1802–1817)

4. Giorgio Jan (1817–1843)
5. Giovanni Passerini (1843–March, 1893)
6. Giovanni Battista De Toni (acting, April–October, 1893)
7. Carlo Avetta (November, 1893–1935)
8. Francesco Lanzoni (in charge, 1935–?)

Open free daily. Source of income: Governmental appropriations and budget of the University. *Library:* About 10,000 pieces. *Herbarium:* "Thousands of specimens." *Plantations:* Medicinal plants. *Publications:* Annual catalog and Notes of research of the director and personnel. Seed List. *Lectures* for the students of pharmacy and veterinary medicine.

PAVIA

REGIO ISTITUTO (ORTO) BOTANICO "GIOVANNI BRIOSI "

Via S. Epifanio No. 6

Established: About 1700. (Decreed, 1765.) *Area:* 1½ ettaro.

Note: Saccardo says that the Garden of Pavia (*Hortus botanicus ticinensis*) did not actually begin until 1774.

Directors:

1. Fulgenzio Vitman (1763–1773)
2. Valentino Brusati (1774–1776)
3. Galli (di Varese) (1777) in charge
4. Giov. Antonio Scopoli (1777–1788)
5. Domenico Nocca (1788) acting
6. Valentino Brusati (1788–1796)
7. Domenico Nocca (1796–1826)
8. Giuseppe Moretti (1826–1853)
9. Sante Garovaglio (1853–1882)
10. Guglielmo Gasparrini (1857–1861)
11. Achille Cattaneo (1882–1883) acting
12. Giovanni Briosi (1883–1919)
13. Gino Pollacci (1919–1920) in charge
14. Luigi Montemartini (1920–1926)
15. Luigi Maffei (1926) acting
16. Gino Pollacci (1927–)

Source of income: Appropriation by the State, admission fees, sale of publications, plants and seeds; laboratory analyses and determinations by the Consorzio Universitario Lombardo. Annual

budget for 1934 was 60,000 Lires. *Library*: Reference only. About 50,000 volumes, including 350 periodicals. *Herbarium*: "Many thousand" specimens. *Plantations*: Systematic (after Eichler); geographic, economic, ecologic, local flora. *Publications*: "Archivio del Laboratorio Crittogamico Italiano" (established in 1874). Discontinued. Some back volumes for sale. "Atti dell'Istituto Botanico e Laboratorio Crittogamico di Pavia," 2nd-4th Series. *Museum*: Open during the school year. *Loan collections* for schools of herbarium specimens, dried seeds, alcoholic material, microscopic slides, photographs. *Study Material*: Living material, including wild plants, are supplied to schools and laboratories for study; and living "microtheca" (many species in culture) most of which are fungi living on man and lower animals. *Affiliation*: Laboratorio Crittogamico Italiano, now: R. Stazione Sperimentale Agraria, devoted to the study of pure and applied Cryptogamy.

PERUGIA

ISTITUTO E ORTO BOTANICO DELLA R. UNIVERSITÀ

Established: 1811. *Area*: About 1 hectare.

Directors:

1. Domenico Bruschi (1811-1854)
2. Alessandro Bruschi (1854-1884)
3. Andrea Batelli (1885-1896)
4. Osvaldo Kruch (1897-1935)
5. Fabrisio Cortesi (1935-)

Not open to the general public. May be visited only on permit of the director. *Source of income*: Budget of the R. Università. *Library*: About 2000 volumes. *Herbarium*: About 4000 specimens. *Plantations*: Ornamental, systematic. *Publications*: Studi di botanica, farmaceutica, sistematica, e di fisiologia vegetale. *Museum*: For teaching purposes only. Not open to the public. *Affiliation*: Facoltà Agraria della R. Università degli Studi di Perugia.

PICCOLO S. BERNARDO (AOSTA)

CHANOUSIA: GIARDINO BOTANICO ALPINO DELL'ORDINE MAURIZIANO

Established: 1897. *Area*: 2.5 hectares. *Altitude*: 2200 meters.

Directors: 1. Ab. Pietro Chanoux (1897-1909); 2. Lino Vaccari (1909-).

Open free daily, 8 a.m. to 7 p.m. *Source of income*: Gran Magistero dell'Ordine Mauriziano and the Ministries of Education

and Agriculture. *Library*: 200 volumes, 400 pamphlets. *Herbarium*: 4000 sheets of alpine plants. *Plantations*: Systematic, geographic, ecologic, medicinal. *Publications*: Annuario della Chanousia. A small *Museum*, open free daily, 8 a.m. to 7 p.m.

PISA

REALE ORTO BOTANICO DELLA R. UNIVERSITÀ DI PISA

Via Luca Ghini 1

Established: Summer of 1543 (Lavallée, Chiovenda); 1544 (C. Fedeli, Saint-Lager); 1545 or later (Pontedera, DeVisiani); 1547 (Saccardo). *Area*: 3 hectares.

Directors:

1. Luca Ghini (1543–1554)
2. Andrea Cesalpino (1554–1558)
3. Luigi Leoni (1558–1582)
4. Lorenzo Mazzanga (1582–1583)
5. Giuseppe Benincasa (o Casabona) (1583–1595)
6. Polidoro Matteini (1595)
7. Francesco Malocchi (1596–1614)
8. Giovanni Rocchi (1614)
9. Domenico Vigna (Acting) (1615)
10. Jacopo Macolo (?Macaulay) 1615–1617)
11. Pancrazio Mazzanga (1617–1625)
12. Matteo Pandolfini (1626–1630)
13. Giacinto Maidalchini (1631–1632)
14. Domenico Vigna (1632–1634)
15. Dionisio Veglia (1634–1636)
16. Claudio Guillermet de Beauregard (called Beriguardi) (1636–1637)
17. Giovanni Le Tellier (1637–1641)
18. Tommaso Bellucci (1641–1672)
19. Pietro Nati (1672–1685)
20. Michelangelo Tilli (1685–1740)
21. Angelo Attilio Tilli (1740–1781)
22. Giorgio Santi (1782–1814)
23. Gaetano Savi (1814–1842)
24. Pietro Savi (1842–1871)
25. Teodoro Caruel (1871–1880)

26. Antonio Mori (Acting) (1880–1881)
27. Giovanni Arcangeli (1881–1915)
28. Biagio Longo (1915–1929)
29. Ugolino Martelli (Acting) (1929–1930)
30. Alberto Chiarugi (1930–)

Open free to the public daily. *Source of income*: Government, through the R. Università di Pisa. *Library*: About 10,000 items. *Herbarium*: About 100,000 sheets. *Plantations*: Systematic, ecologic. *Arboretum* (including shrubs). *Publications*: Acta Horti Pisani (Vol. I, 1930–37; Vol. II, 1937); Index Seminum. *Study material* sometimes supplied to schools.

Historical Note: The first three botanic gardens of the world are Pisa, Padua, and Florence, and it has long been a mooted question as to which of the first two is the oldest. M. Lavallée, as President of the Société Nationale d'Horticulture de France, delivered an address on August 16, 1882, which is reported in the Gardeners' Chronicle (England), for July 7, 1883. In that address he credits the establishment of a botanic garden in Pisa ("the first botanic garden" he calls it) to the Grand Duke Cosimo de Medici I, of Florence, and gives the date as 1543.

Mattiolus, in the Preface to his *Commentaries*, published in 1559, says that it was the new garden at Padua that inspired Cosimo to found the garden at Pisa. Pontedera, in his posthumous work (*Epistolae ac dissertationes*, p. 251. 1791), says that Padua, founded in 1545, was the first garden, Pisa later ("*Primus hortus patavinus existit, qui ab anno 1545 principium ducit, pisanum autem secundum titulus januae superpositus ostendit*").

C. Fedeli (*Atti Soc. Tosc. Sci. Nat. proc. verb.*, p. xxvii, pp. 8–20. 1918.) states that the Pisa Garden was founded in 1544, "one year before Padua," but Robert DeVisiani, director of the Padua garden from 1836 to 1878, and his successor, Pier Andrea Saccardo, insist on a later date (subsequent to 1545).

The latest careful study of this question is that of Emilio Chiovenda (*Note sulla fondazione degli orti medici di Padova e di Pisa. Estratto dagli "Atti dell'VIII Congresso Internazionale di Storia della Medicina. Roma, Settembre 22–27, 1930."* Pisa, Stab. V. Lischi & Figli. 1931). He refers to DeVisiani's assertion that the Pisa garden could not have been founded in 1544, since it is

located on the ruins of the ancient Monastery of St. Vito; that was not evacuated by the nuns until October 27, 1544, and a botanic garden could not have been established between that date and the end of the year. However, Chiovenda points out, "the convent had annexed a garden before its demolition took place. . . . The development of the Garden of Pisa would therefore have occurred twice; the first time it was simply formed out of the garden adjacent to the Convent of St. Vito; the second time it was formed out of the same garden reorganized after the demolition of the convent; which work led to the final establishment of the Botanic Garden of Pisa." Cosimo, says Chiovenda, transferred the Franciscan nuns from the Convent of St. Vito to that of St. Lorenzo on October 27, 1544 (common indiction). The following November the Convent was destroyed, during the revolution, and out of its grounds and those of the already existing Botanic Garden adjacent to the Convent, a new Arsenal and the new and larger Botanic Garden were created.

The old garden was the garden which Luca Ghini used for the purpose of growing the plants he was collecting. The evidence for this, says Chiovenda, is found in a letter dated Bologna, July 4, 1545, which Ghini addressed to the Steward of the Grand Duke, Pier Francesco Riccio. During the 12th and 13th of the preceding month he had, with his herbalist, collected living plants in the Pistoiesian Alps, "many and most beautiful, which I have planted with great care in the garden at Pisa. . . . I therefore pray your excellency that you do me the favor to commission me to take charge of the beautiful garden in Pisa, as I wish to convert it . . . into a garden which will delight your Excellency and prove of value to the students."

"Here it is evident," says Chiovenda, "that two separate and distinct gardens are treated of: the first is one which, at the moment when Ghini was writing, was in complete operation, as it was receiving the plants which he and his herbalist collected in the summer of 1545; the second garden, which he petitions for in his letter to develop, was evidently the Botanic Herb Garden which he alone initiated. Therefore, we are certain that the Botanic Garden of the University of Medicine already existed June 12-13, 1545, when Ghini was gathering herbs on the Figatense, as recorded in this letter."

In the same letter Ghini speaks of collecting plants in the Apuane Alps in 1544 to place in the Pisa garden. From this Chiovenda infers that the Pisa garden was in existence as early as 1543.

Chiovenda finds the above evidence confirmed by Luigi (Aluigi) Squalermo (called Anguillara), a herbalist to Ghini, in an "opinion" (Parere XIV) which he dedicated to Giacomo Antonio Cortuso, at Padova, May 20, 1560, in which Anguillara writes that in 1542 he found the spurge, "la Pitiusa" (*Euphorbia Pithiusa* L. ?), on the Black Mountains of Livorno, and that he brought it for "Professor Luca" (i.e. Ghini) to Pisa. Therefore Ghini would appear to have been at Pisa during the summer of 1542 to receive the plants gathered for him by Anguillara. See *Nantes* (1), last sentence before "Directors." Also *Rome* (2), *Note*; and *Venice*.

But since Duke Cosimo did not decide on the appointment of Ghini to Pisa until after Fuchs had refused the position in the beginning of 1543, Chiovenda points out that Ghini could not have been at Pisa before 1543, and that the date 1542, given by Anguillara, is a mistake and should be 1543. "Consequently," says Chiovenda, "this would be a proof that in the summer of 1543 Ghini was already engaged in a Botanic Garden at Pisa, for use at the University."

Anguillara (says Chiovenda) was the first herbalist for Ghini at the Botanic Garden of the University of Pisa, and was succeeded by Simone from St. Momeo. He subsequently became the first "director" of the Botanic Garden of Padua (q.v.).

"Thus," says Chiovenda, "we obtain a glimpse behind the scenes of the establishment of the original Botanic Garden of Pisa, wherefore we can maintain that the beginning of its construction took place in the summer of 1543, through the work of Professor Luca Ghini, assisted by the herbalist, Luigi Anguillara."

PORTICI

ORTO BOTANICO DELLA FACOLTÀ DI AGRARIA DELLA
R. UNIVERSITÀ DI NAPOLI

Ex Palazzo Reale, Portici, presso Napoli

Established: 1872. *Area*: 2 ha.

Directors:

1. Nicola Pedicino (1872-1877)

2. Orazio Comes (1877–1917)
3. Camillo Acqua (in charge) (1917–1918)
4. Francesco De Rosa (in charge) (1918–1919)
5. Alessandro Trotter (in charge) (1919–1923)
6. Giuseppe Zodda (in charge) (1923–1924)
7. Giuseppe Lo Priore (1925–1928)
8. Alessandro Trotter (in charge) (1928–1932)
9. Giuseppe Catalano (1933–)

Supported by governmental appropriations. *Herbarium*: 20,000 specimens. *Library*: 5000 volumes and pamphlets. *Publication*: Index Seminum.

ROME (ANCIENT) (1)

GARDEN OF ANTONIUS CASTOR

According to Pliny (Nat. Hist., XX, Chapter 100; XXV, Chapter 5), Antonius Castor, who lived in Rome in the first century A.D., had a botanic garden, which seems to have been the first one in Rome. In Book XXV (Chapter 5) Pliny says that he had the opportunity of visiting this garden in which Antonius, though he had passed his hundredth year, “cultivated vast numbers of plants with the greatest care.”

ROME (2)

R. ORTO BOTANICO DELLA R. UNIVERSITÀ DI ROMA
Via Milano 75

Established: Vatican Garden, 1566; Rome, 1660? (See Note.)
Area: About 10 hectares.

Note: As early as about 1288 there existed at the Vatican a pharmaceutical garden (not for instruction), planted by Simone Genuense, physician to Pope Niccolò IV. Also Niccolò V had a similar garden at the Vatican about 1447, “filled with all kinds of herbs.” A true scientific garden for instruction was instituted at the Vatican about 1566 by Michele Mercati, physician of Clement VIII, and a pupil of Cesalpino. The Botanic Garden of Rome was founded at the Vatican, says Saccardo (*La Botanica in Italia*. Venezia. 1895. p. 193), under Alexander VIII, about 1660, and was under the direction of G. B. Trionfetti. In 1870 the garden

was relocated at Via Panisperma 89B, Rome. Subsequently, its address was Via Milano 75.

Directors:

1. Michele Mercati (probably under supervision of Andrea Cesalpino) (1566–1593)
2. Andrea Bacci (Baccio?) (1593–?)
3. Castore Durante (?–1600)
4. Giovanni Feber (supplemented temporarily by Antonio Nanni) (?–1630)
5. Pietro Castelli (1630–1638)
6. Giovanni Benedetto Sinibaldi (1638–?)
7. Domenico Panarola (1646–?)
8. Francesco Sinibaldi (1667–?)
9. Giovanni Battista Trionfetti (1676–1706)
10. Pietro Assalti (1706–?)
11. Antonio Volpi (?–?)
12. Antonio Celestino Cocchi (1726–?)
13. Cosimo Grilli (1728–?)
14. Angelo Marcangeli (?–?)
15. Giuseppe De Panicis (?–1747)
16. F. A. Cinnaneschi (1748–?) (Prof. of theoretical botany)
17. Francesco Maratta (Maratti) (assisted by Lib. Sabbati) (1748–d. 1777)
18. Giorgio Bonelli (?–1777)
19. Niccolo Martelli (also Prof. of botany) (1777–1805)
20. M. A. Poggioli (Prof. of theoretical botany) (1805–1843)
21. Antonio Sebastiani (Director and Professor of practical botany) (1813?–1820)
22. Ernesto Mauri (Director & Professor) (1820–1831)
23. Carlo Donarelli (assisted by Giulio Verni) (1831–1851)
24. Pietro Sanguinetti (Professor) (1843–1855)
25. Francesco Ladelci (Professor) (1855–1870?)
26. Ettore Rolli (Professor) (1851?–1870?)
27. Giuseppe De Notaris (1870–1877)
28. Nicola Pedicino (1877–1883)
29. Romualdo Pirota (1884–1928)
30. Enrico Carano (1928–)

Does not serve as a public park, but may be visited with the permission of the director. *Source of income*: Governmental grant. *Library*: That of the Regio Istituto Botanico di Roma. *Herbarium*: Of cultivated plants only. *Plantations*: Systematic, economic, ecologic. *Publications*: Catalogo del R. Orto Botanico di Roma. (Established 1885.) Index seminum, sporarum, fructuum. Storia della Botanica in Roma e nel Lazio. The scientific publications of the garden are published with those of the Regio Istituto Botanico in the *Annali di Botanica*. The museum is open during the same hours, and under the same conditions as the garden.

SALERNO

MEDICINAL PLANT GARDEN OF MATTHAEUS SYLVATICUS

Dating from 1309. Not now in existence

SASSARI

ORTO BOTANICO

Via Rizzedder

Established: 1888.

Directors: Fausto Morini (1888–1892) ; Leopoldo Nicotra (1892–?).

Note: An earlier small botanic garden was completely abandoned in 1853.

SIENA

ORTO BOTANICO DELLA R. UNIVERSITÀ DI SIENA

Via Pietro Andrea Mattioli 2

Established: 1784.

Directors:

1. Biagio Bartalini (1784–1822)
2. Giuseppe Giuli (1822–1851)
3. Giovanni Campani (1851–1860)
4. Attilio Tassi (?)
5. Flaminio Tassi (1905–1906)
6. Biagio Longo (1906–1916)
7. Agilulfo Preda (1916–1920)
8. Gino Pollacci (1920–1926)
9. Alfonso Nannetti (1926–1929)

10. Alberto Chiarugi (1929–1930)
11. Umberto D'Ancona (1930–1934)
12. Mario Aiazzi-Mancini (1934–1935)
13. Arturo Nannizzi (1935–)

Note: In 1588 a professorship of "Simples" was instituted at the University of Siena by Grand Duke Ferdinand, of Tuscany. The first professor was Adriano Moreschini (1588–1617). The seventh professor, Pietro Maria Gabrieli (1669–1705), formed about 1684 a herbarium of plants collected in the surrounding fields. The garden of simples was, in time, annexed to the Hospital of S. Maria della Scala. In 1756 the lectureship of simples was discontinued, and three years later there was instituted a course of instruction in Natural History, given by Giuseppe Baldassarri, physician to the Monk superior of Monte Oliveto Maggiore. Baldassarri (1759–1782) had enriched the small Pharmaceutical Garden of that Monastery. Finally, in 1784, Pietro Leopold, Grand Duke of Tuscany, decided to establish at Siena a true botanic garden, and to transform for that purpose, the Orto dei Semplici annexed to the Hospital of S. Maria della Scala. Biagio Bartalini, who succeeded Baldassarri, became first director of the Orto Botanico, as above indicated.

Source of income: Government. *Library:* 1200 volumes, 3000 pamphlets. *Herbarium:* 3000 specimens. *Plantations:* Ecologic, officinal plants. *Arboretum* and *Fruticetum*. *Publications:* Seed List. The Garden serves for the teaching of pharmaceutical botany to the students of the Faculty of Pharmacy.

TRENTA (GORIZIA)

GIARDINO BOTANICO ALPINO "JULIANA"

TRIESTE

CIVICO ORTO BOTANICO

Via Carlo de Marchesetti 2

Established: 1828. *Area:* 8500 square meters.

Note: The Commune of Trieste reestablished this Garden in 1879 to honor the memory of its illustrious citizen, M. Tommasini.

Directors:

1. Bartolomeo Biasoletto (1828–1859)
2. (Garden abandoned, 1860–1878)
3. Raimondo Tominz (1879–?)
4. Carlo de Marchesetti, honorary director of the Museum of Natural History and director of the Botanic Garden, died April 2, 1926. (Science, 63: 473. May 7, 1926.)
5. Mario Stenta (as of April 2, 1926–1928)
6. Giuseppe Müller (1928–)

Open daily, 7 to 12 a.m. and 3 to 6 p.m. *Source of income:* City of Trieste. *Library and Herbarium* (Erbario Tommasini, etc.) at the Museo di Storia Naturale. *Plantations:* Alpine and Medicinal plants, etc.

TORINO (TURIN)

R. ORTO BOTANICO DELL'UNIVERSITÀ DI TORINO

Viale Mattioli N. 31 (al Valentino), Torino (106)

Established: 1729. *Area:* About 2 ha.

Directors:

1. Bartolomeo Caccia (1729–1749)
2. Vitaliano Donati (1749–lost at sea, 1763)
3. Carlo Allioni (1760–1781) (at first acting director)
4. Giovanni Pietro Maria Dana (1781–1801)
5. Giovanni Battista Balbis (1801–1814)
6. Giovanni Biroli (1815–1817)
7. Carlo Matteo Capelli (1817–1831)
8. Giuseppe Giacinto Moris (1831–1869)
9. Giovanni Battista Delponte (1870–1879)
10. Giovanni Arcangeli (1879–1883)
11. Giuseppe Gibelli (1883–1898)
12. Saverio Belli (1898–1900)
13. Oreste Mattiolo (1900–1932)
14. Carlo Cappelletti (Nov. 1932–)

Admission by permission of director. *Source of income:* Governmental appropriations. *Library:* Reference. About 9000 volumes and 6000 pamphlets. *Herbarium:* About 406,000 specimens. The “*Arboretum*” comprises both trees and shrubs. *Plantations:* Systematic, according to Engler. *Publications:* Enumeratio Semi-

num pro commutatione (Biennial); Lavori Eseguiti dal Personale Scientifico (Biennial). Cronistoria dell' Orto Botanico della R. Università di Torino, 1792–1929; By Oreste Mattiolo. *Museum*: Comprises: General Herbarium; Herbarium Pedemontanum: Seed Collection (about 4000 tubes containing specimens); A collection of Woodcuts; Models of flowers which can be dismembered for teaching purposes; Dried specimens of medicinal plants. Museum open by permission of the Director. *Affiliations*: The garden is part of the Royal Botanic Institute of the University of Turin.

URBINO

ORTO BOTANICO DELL'UNIVERSITÀ

Via Bramante 28

Established: 1809.

Directors:

1. Andrea Marcantini (1828–1832)
2. Pietro Camici (da Pistoia) (1832–1860)
3. Antonio Federici (1860–1884)
4. Dante Badanelli (interim) (1885)
5. Giovanni Alberto Mammini (1886–1895)
6. Angelo Agrestini (1895–1912)
7. Guido Pesci (interim) (1913–1916)
8. Giacomo Damiani (interim) (1917–1919)
9. Maria Sambo Cengia (interim) (1920–1923)
10. Cesare Sibilia (interim) (1923)
11. Giuseppe Speranzini (interim) (1924–1925)
12. Egidio Barsali (1926–)

Note: The Garden was first planted in 1809, as an annex to the Lyceum, by Giovanni de Brignoli de Brunhoff, then professor of botany and agriculture, near the convent of St. Francesco. It became affiliated with the University in 1815, especially with the chair of botany of the school of Pharmacy. (Saccardo.)

Source of income: The University. *Library*: Included in the University Library. *Herbarium*: About 5000 specimens. *Publication*: Catalogo dei Semi.

VENICE

A Medicinal Plant Garden, dating from 1533, is said to have been established by Gualtieri on a site given by the Venetian state.

VALLOMBROSA

See Florence (Firenze) (2), page 272

VENTIMIGLIA

HANBURY BOTANIC GARDEN

La Mortola, Ventimiglia

Established: 1867. *Area:* 120 acres.*Directors (Curators):*

1. Gustav Cronmeyer (In office, 1889)
2. Curt Dinter (In office, 1897)
3. Alwin Berger (1914)
4. Joseph Benbow (1914–1923)
5. S. W. McLeod Braggins (1923–1935)
6. Mario Ercoli (1935–)

Open on Monday and Friday afternoons. Admission fee, 5 Lire. *Library:* Reference only. 4000 volumes. Current periodicals regularly received, 20. *Herbarium:* 10,000 specimens. *Plantations:* Consist entirely of sub-tropical plants, trees, shrubs, and herbs, with a very few species under glass. There is a large collection made by E. H. Wilson in China, and another by Brunnthaler in South Africa. Also representatives from intertropical countries, including Australia, New Zealand, Mexico, and Africa. *Publications:* Alphabetical Catalogue, 1889. Edited by G. Cronmeyer. Systematic Catalogue, 1889. Edited by G. Cronmeyer. Alphabetical Catalogue, 1897. Edited by C. Dinter. Florula Mortolensis, 1905. Edited by A. Berger. Hortus Mortolensis, 1912, by A. Berger; La Mortola Garden, 1937, by Lady Hanbury. Seed List (yearly), since 1883. *Museum:* Not public. Admission by letter from Gr. Uff. Cecil Hanbury, M.P. Comprises woods, seeds, fruits, herbarium specimens, and specimens preserved in alcohol. *Living material* for study is supplied to students (but not to schools) occasionally when requested. 15,000 packages of seeds is a yearly output. *Note:* The money received for entrance fee is given to local charities, foremost among these being the Ventimiglia hospital.

Jamaica (See British West Indies)

Japan

KASUKABECHO

EXPERIMENTAL GARDEN OF MEDICINAL PLANTS

Kasukabecho, Saitamaken

Established: 1924. *Area:* 5.6 acres.*Director:* T. Kariyone (1924–).

Open free daily except Sunday. *Source of income*: Government. *Herbarium* of medicinal plants only. *Plantations*: Official and non-official medical plants; aromatic, and poisonous plants. Belongs to the Imperial Hygienic Laboratory, Kanda-Izumicho, Tokyo.

KOBE

BOTANICAL GARDEN OF KOBE

Kobe City Office

Established: A letter of September 18, 1936, from Sakuichi Nishi, Chief, Department of Industry, states that plans were under way to establish "a municipal botanical garden."

KOSHUN

KOSHUN BOTANICAL GARDEN

Koshun, Formosa, Japan

Established: 1902. *Area*: 576 hectares.

Directors (Curators): Yasusada Tashiro (1902–1910); T. Inamura (1910–1928?); Sakujiro Matuura (23 April, 1928–).

Serves as a public park. Open free at all times. *Source of income*: Government General of Formosa. *Plantations*: "The plants are mostly trees and shrubs." *Study collections and living material* supplied to schools. *Publications*: Titles supplied in Japanese only in our returned questionnaire.

KYOTO

THE KYOTO BOTANIC GARDEN

Simogamo

Established (opened): Nov. 10, 1923. *Area*: 27 hectares.

Directors: 1. K. Koriba (Aug. 18, 1921–Oct. 19, 1929). 2. A. Kikuchi (Oct. 19, 1929–).

Serves as a public park. Open daily, sunrise to sunset. *Admission*: 5 sen. *Source of income*: Endowment income; admission fees. *Library*: About 1000 volumes. *Herbarium*: About 5000 specimens. *Plantations*: Horticultural, economic, ecologic. *Publications*: List of conifers and bamboos planted in the Garden; List of flowering trees and shrubs planted in the Garden. *Affiliation*: The director is Professor in the Department of Agriculture, Kyoto Imperial University.

NIKKO (TOCHIGI-KEN)

BOTANIC GARDENS OF THE FACULTY OF SCIENCE

Tokyo Imperial University, Tokyo

Director: Takenoshin Nakai (1937).

SAPPORO (1)

DEPARTMENT OF BOTANY, FACULTY OF SCIENCE

Hokkaido Imperial University

Director: Y. Yamada (1936). List of Seeds and Spores.*Note:* The Dept. of Botany issues a *Seed List* separately from that of the Botanic Garden of the Faculty of Agriculture. The address should not be confused.

SAPPORO (2)

BOTANIC GARDEN OF THE FACULTY OF AGRICULTURE

Hokkaido Imperial University

Established: 1884. *Area:* About 32 acres.*Directors:* Kingo Miyabe (1884–1927); Seiya Ito (1927–1936); Y. Tochinai (1936–).*Open daily,* April 1 to November 30. *Admission,* 5 sen. *Source of income:* Governmental appropriations. *Plantations:* Systematic, ecologic. *Arboretum.* *Fruticetum.* *Publication:* Seed List. *Museum:* Open same as the Garden. *Study material* supplied on request to local schools.

TAIHOKU

TAIHOKU BOTANIC GARDEN

Taihoku, Taiwan (Formosa)

Established: 1897. *Area:* 42.47 acres.*Directors:* Y. Kudo (1930–1932); Schinichi Hibino (1932–).*Serves as a public park.* Open free daily. *Source of income:* Government. *Library:* 3500 volumes. *Herbarium:* 33,000 specimens. *Plantations:* Economic plants. *Arboretum.* *Publication:* Annual Report; Seed List. *Affiliation:* Taihoku Imperial University, and Department of Forestry, Government Research Institute, Taihoku, Taiwan (Formosa).

TOKYO (1)

BOTANIC GARDENS OF TOKYO IMPERIAL UNIVERSITY

Koishikawa Ku

Established: 1684. *Area*: About 45 acres.*Administrators (Kanri)*:

1. Dôen Kinoshita (1684–1711)
2. Onoji Akutagawa (1711–1721)

Commissioners (Bugyo):

- 3a. Onoji Akutagawa (1721–1868)
 ("Name inherited")
- 3b. Rizaemon Okada (1721–1868)
 ("Name inherited")

Administrators (Kanri):

4. Yoshikata Hatakeyama (1868–1871)
5. Naomi Hirose (1871–1873)
6. Motoyoshi Yamashina (1873–1877)
7. Ryokichi Yatabe (1877–1890)
8. Jinzo Matsumura (1890–1897)

Directors (Enchô):

9. Jinzo Matsumura (1897–1922)
10. Manabu Miyoshi (1922–1924)
11. Bunzo Hayata (1924–1930)
12. Takenoshin Nakai (1930–)

Open to the public daily (except January 1), 6, 7, 8 a.m. to 4, 4:30, 5, 5:30, 6 p.m., according to season. *Admission*: 10 sen; child under 7 years old, free. *Source of income*: Government (10,000 yen, 1938), entrance fees and sale of plant material. (Total budget, 1937, 40,000 yen.) *Library*: 50,000 volumes, 15,000 pamphlets. *Herbarium*: Approximately 200,000 specimens. *Plantations*: Herbaceous garden, Water plants, Medical, Economic, and Alpine plants. *Arboretum*. *Fruticetum*. *Conservatories*. *Publication*: Seed exchange list. *Living study material* supplied to local schools.

TOKYO (2)

"BOTANICAL GARDENS OF THE IMPERIAL HOUSEHOLD"

(Imperial Palace Botanic Garden)

Shinjuku Yatsuya-Ku

In the *Proceedings* of the Linnean Society of London (Session 1931–32, Part IV, p. 147), it is stated that His Imperial Majesty,

the Emperor of Japan, maintains a private botanic garden and laboratory.

In a letter of January, 1934, a correspondent of the author, Mr. Bunkio Matsuki, reports that he made a careful investigation "in regard to a botanic garden in the Imperial Household," with the aid of the Imperial Household Librarian, Hon. S. Kitsui, and found as follows:

"His Majesty, the Emperor of Japan, is an earnest student of biology and possesses a laboratory in Momijiyama, which is a part of the private Imperial Palace Garden. As far as the investigation was made there is no botanic garden in the compound of the Imperial Palace. But, in one sense, the whole Momijiyama (which means 'Maple-Mount') is devoted to all kinds of flowers, and itself is a botanic garden."

TOKYO (3)

TSUMURA MEDICINAL PLANTS GARDEN

Tsumura Laboratory, Senkawa, Jindaimura

Director: Jukyu Cho. *Note:* Questionnaire not returned. The claim was made (in 1934) that this was the only medicinal plant garden in Japan. *Publication:* Bulletin (No. 1, January, 1931).

Java (Netherlands East Indies)

BUITENZORG

's LANDS PLANTENTUIN

(GOVERNMENT BOTANIC GARDENS)

Established: 1817. *Area:* 86 hectares (205 acres) at Buitenzorg; 60 ha. (150 acres) at Tjibodas (Mountain Garden at 4500 feet elevation). (*See Tjibodas.*)

Directors:

1. Caspar Georg Carl Reinwardt (1817–1822)
2. Carl Ludwig Blume (1822–1826)

From 1826–1868 there were no directors, but several non-botanical superintendents instead.

3. Rudolph Hermann Christian Carl Scheffer (1868–1880)
4. Melchior Treub (1880–1909)

5. J. C. Koningsberger (1909–1918)
6. W. M. Docters van Leeuwen (1918–1932)
7. K. W. Dammerman (1932–March, 1936) (Acting)

Serves as a public park. Open free, daily, 6 a.m.–6 p.m. *Source of income:* Appropriations by the government; income from the Treub fund, established 1936. *Library:* Not separated from the library of the Department of Agriculture. *Herbarium:* About 500,000 sheets. *Publications:* Annales du Jardin Botanique de Buitenzorg. Established 1876; Bulletin du Jard. Bot. de Buitenzorg; A Catalog of the plants cultivated at Buitenzorg, Tjibodas, and Pasar Ikan, as Supplementary Vol. I of the Bulletin (1930); Flora of Buitenzorg (Parts i–vi, 1898–1905); Icones Bogorienses (Vols. 1–4, 1897–1914); Seed List. *Laboratories:* Special accommodations for visiting investigators at Buitenzorg (6 places) and at Tjibodas. *Plantations:* Systematic. “As tropical plants are mainly woody the Garden is principally an *Arboretum-Fruti-cetum*.” (See Sumatra.)

LAWANG

The private Garden of Mr. Buijsman (or Buysman), altitude, 1230 meters, no longer exists. Mr. Buijsman died in 1919.

TJIBODAS (NEAR SINDANGLAIJA)

MOUNTAIN GARDEN TJIBODAS

Address: Buitenzorg

Established: 1862. *Area:* 60 ha. Open free daily. Elevation, 4500 feet.

This Garden belongs to the Buitenzorg Garden; its assistant curator is under the direction of the head curator of Buitenzorg. “Immediately behind this mountain Garden, which is situated on the N. slope of Mt. Gedeh-Pangerango, stretches the forest clad slope of this twin volcano. Between the over 9000 feet towering summits and the mountain Garden, the forest, crater and waterfalls are declared a nature preservation; the forest has been made passable by numerous paths. Several hundreds of trees have been numbered, identified and labelled for the convenience of the scientific visitors. Next to this “jungle-garden” there is a garden for ornamental plants (herbs, shrubs and trees). There is a library, a laboratory which offers places for three investigators, a small museum of insects, birds and mammals representing the fauna of

the mountain and a herbarium representing the local flora. There is a neighbouring resthouse with 8 beds. The laboratory offers a dark room and other laboratory requisites. The Garden can be reached from Buitenzorg in $1\frac{1}{4}$ hour by car and a quarter of an hour walk. Up the mountain there is a small resthouse at 7500 feet with 3 beds called Lebaksaät; here is also a small library, some instruments, and further accommodation for scientists studying the mountain flora. Also on summit of Mt. Pangerango (over 9000 feet) there is a small resthouse." (*See Buitenzorg.*)

PASAR IKAN

There is a small coastal garden on the shore near Batavia, under supervision of the Head Curator of Buitenzorg, administered as a zoological subdivision of the Buitenzorg Garden, primarily for marine biological research. "The mangrove plants are labeled and numbered." (Letter of May 13, 1938, from D. F. Van Slooten, Curator of Herbarium, Buitenzorg.)

Jugoslavia

BEOGRAD (BELGRADE)

BOTANICAL INSTITUTE, GARDEN, AND HERBARIUM OF THE
UNIVERSITY

Jevremorac, Botanička bašta

Director: Ljub. M. Glišić (1935).

Publication: Delectus Seminum.

LJUBLJANA (LAIBACH)

BOTANICAL GARDEN OF THE UNIVERSITY
(BOTANIČKI VRT UNIVERZE KRALJA ALEKSANDRA
I. v LJUBLJANI)

Established: 1809. *Area:* 72 ares, 44 sq. meters.

Directors:

1. Franz Hladnik (1809–1834)
2. Biatzowsky (1834–1850)
3. Andreas Fleischmann (1850–1867)
4. Konšek (1867–1886)
5. Alfons Paulin (1886–1931)

6. Fran Jesenko (1931–1932)

7. Stjepan Horvatič (1932–)

Open free daily, 9 to 12 noon and 2 to 5 p.m. *Source of income*: Appropriations by the State. *Library*: That of the Botanical Institute (about 3150 volumes). *Herbarium*: That of the Institute (about 6000 species). *Plantations*: Systematic, geographic-ecologic. *Publication*: Index Seminum.

ZAGREB

BOTANIČKI VRT I ZAVOD UNIVERZITETA

(BOTANIC GARDEN AND INSTITUTE OF THE UNIVERSITY)

Zagreb, Marulic trg 20

Established: 1890. *Area*: 8 hectares.

Director: Vale Vouk (1915–).

Serves as a public park. Open free to the public daily, except Saturdays. *Source of income*: Governmental subvention. *Library*: About 5000 volumes. *Herbarium*: About 120,000 specimens. *Plantations*: Systematic, geographic, economic. *Arboretum and Fruticetum*. *Publications*: Acta Botanica of the Botanical Institute. Delectus Seminum.

Latvia

RIGA

BOTANIC GARDEN OF THE UNIVERSITY OF LATVIA

(LATVIJAS UNIVERSITĀTES BOTANISKAIS DĀRZS)

Alberta ielā 10

Established: 1922. *Area*: 10 hectares.

Director: Nikolajs Malta (1922–).

Open free, Sundays and Wednesdays, 8 a.m. to 5 p.m. *Source of income*: Governmental appropriations. *Library*: 5000 volumes. *Herbarium*: Approximately 120,000 specimens. *Plantations*: Systematic, economic, morphologic. *Arboretum*. *Fruticetum*. *Publications*: Acta Horti Botanici Universitatis Latviensis (Latvijas Universitātes Botaniskā Dārza Raksti); The Greenhouses of the Botanic Garden of the University of Latvia (Latvijas Universitātes Botaniskā Dārza augu mājas). Seed List (Sēklu Saraksts). *Study material* supplied to schools.

Lithuania

KAUNAS (KOWNO) (1)

BOTANIC GARDEN OF THE UNIVERSITY OF VYTAUTUS THE GREAT
(VYTAUTO DIDŽIOJO UNIVERSITETO BOTANIKOS SODAS)
V. D. Un-to Botanikos Sodui

Established: 1923. *Area:* 40 hectares.

Director: Constantin Regel (1923—).

Serves as a public park. Admission, free, 9 a.m. to 6 p.m.
Source of income: In 1937—119,400 Litas and the salary of the staff from the University. Governmental appropriations. *Library:* About 8000 volumes at the Botanic Institute of the University. *Herbarium:* About 55,000 specimens. *Arboretum:* About 310 species. *Fruticetum:* About 380 varieties. *Plantations:* Systematic, geographic, economic, morphologic, ecologic, rosarium, etc. *Publications:* Delectus seminum. Scripta horti Botanici Universitatis Vytauti Magni. *A small museum* with about 3000 specimens. *Affiliation:* With the University at Kaunas, which has also three sections of applied botany: a. medicinal plants; b. plant diseases; c. nursery for trees and shrubs.

KAUNAS (KOWNO) (2)

MEDICAL PLANT SECTION OF THE BOTANIC GARDENS OF THE
UNIVERSITY

V. D. Un-to Botanikos Sodui Vaistiniu Augalu Skyrius

Director: Provisor K. Grybauskas (1936).

Publications: Lithuanian Medicinal Plants, Vols. I & II, by K. Grybauskas. Seed List.

Luxembourg

LUXEMBOURG

The old botanic garden of the Grand Duchy of Luxembourg has been abandoned, and the grounds transformed into a public park. The herbarium of the former garden was transferred to the Musée National. There is still (1937) the Botanische Abteilung des Grossherzoglichen Instituts.

Madagascar

TANANARIVE (ANTANANARIVO)

PARC BOTANIQUE ET ZOOLOGIQUE DE TANANARIVE

Established: 1927. *Area:* 23 ha.

Directors: François (*Head Gardener*) (1927–1934); P. Boiteau (*Directeur du Jardin Botanique*) (1934–).

Serves as a public park. Open free, daily, except Sunday. *Source of income:* Government appropriations. *Herbarium:* 4000 specimens (local flora). *Plantations:* Ecological (Ombrarium, Rocailles, Plantes Humides, etc.). *Publication:* Index Seminum et Sporarum (Index l'Échanges). *Museum:* Being reorganized. *Lectures* are given to school children and *study material* is loaned and given to schools. *Greenhouses* include an "aseptic" house for growing *Rhizoctonia* symbionts of indigenous orchids. *Note:* 830 species cultivated—230 Madagascar flora, 600 foreign, principally xerophytes from Mexico, U. S. A., So. Africa and Mauritius.

Malta

FLORIANA (Suburb of LA VALLETTA)

THE BOTANIC GARDEN OF THE ROYAL UNIVERSITY OF MALTA (ARGOTTI BOTANIC GARDEN)

Established: 1675 or 1676, "in the moat of St. Elmo" (at the northeast extremity of Valetta within the high wall of the fortifications), under the Order of St. John of Jerusalem, by Dr. Josephus Zammit, a Maltese physician and Abbot to the Order. He was professor of botany in the University of Malta. Not a trace of this garden is left.

In the early 19th century (1805?) under the British Government, the Garden was transferred to Floriana, between the inner and outer fortifications, south of Valetta. In 1804 (1805?) the professor of botany was P. F. Carolus Hyacinthus (Giacinto), Carmelita Excalceatus, who planted the "Maglio," at the southwest end of Valetta. About 1855 the Garden was transferred to another site in Floriana, where the old palace and grounds of Bailiff Argotti stood. The botanic garden was then allotted only one-third of an acre, and the rest of the area, including "the Maglio" (where the monks of St. John played the game

“maglio”) was withdrawn from the control of the professor of botany. In 1885 the staff of the Garden (one keeper, two gardeners, one laborer) was transferred from the Public Works to the Education Department. On February 1, 1892, the botanic garden was extended to the whole of the Argotti Garden, designated “Argotti Botanic Garden” and became a place of instruction for medical students, not open to the public. (*Debono, T. Argotti Botanical Gardens and the Flora of Malta. Jour. Royal Hort. Soc.* 27: 564. Dec. 1902.)

Directors:

1. Guiseppe (Josephus) Zammit (1675–?)
2. P. F. Carlo Giacinto (Carolus Hyacinthus) (1805)
3. Stefano Zerafa (1827)
4. Giovanni Carlo Grech-Delicata (1859–1870)
5. Gavino Gulia (1879–1889)
6. Francesco Debono (April 22, 1890–?)
7. S. L. Vella (1937)

Publications: Seed List. *Index Plantarum Horti Botanici*, 1806, by Professor Giacinto.

Manchoukuo

HARBIN (CHARBIN)

BOTANIC GARDENS OF THE MANCHURIAN RESEARCH SOCIETY

Director: I. Fukushima (1937).

PORT ARTHUR (Ryojun)

BOTANIC GARDENS

Director: J. Sato (1937).

Mauritius

PAMPLEMOUSSES

BOTANIC GARDEN OF PAMPLEMOUSSES

Director of Agriculture, Reduit

Established: 1735. *Area:* About 130 acres (90 arpents).

Successively known as Jardin “Mon Plaisir,” Jardin des Plantes, and Jardin Royal.

Directors:

1. Le Poivre (17 July, 1767–October, 1772)
2. Jean Nicolas de Céré (1774–May 2, 1810)
3. Auguste Céré (1810–December 3, 1810)
The Island surrendered to the British, December 3, 1810.
4. John White (1820–1826)
5. Mr. Burke, Honorary Supervisor.
6. Charles Telfair, Honorary Supervisor (1826–1829)
7. J. Newman (1829–1849)
8. James Duncan (May 1849–1864)
9. Charles James Meller (1864–1866)
10. John Horne (ad interim, 1866–August, 1876)
11. John Horne (1876–August, 1893)
12. William Scott (1893–July, 1898)
13. Joseph Vankiersbilck (1898–September, 1903)
14. Paul Koenig (16 September, 1903–1913)
15. Frank Arthur Stockdale (1913–1916)
16. Gilbert Grahame Auchinleck (1916–1917; acting)
17. Harold Augustin Tempany (1917–1929)
18. Donald d'Emmerez de Charmoy (1929–1930)
19. Alexander George Glendon Hill (1930–1932; acting)
20. Gilbert Edwin Bodkin (1932–)

Note: On the creation of the Agricultural Department the Pamplémousses Garden came under the administration of the Director of the Department, July, 1913, and the scientific work centered on the study and cultivation of sugar cane, and the scientific application of manures to increase its productivity. (Bull. Misc. Information. Kew. Nos. 6 and 7. 1919. Pp. 279–286.)

Serves as a public park. Open free daily, 6:30 a.m. to 6 p.m.
Source of income: From General Revenue of the Colony. *Library and Herbarium* have been transferred to the Department of Agriculture and Mauritius Institute. *Plantations:* Systematic and economic. *Arboretum.* *Fruticetum.*

Mexico

CHAPULTEPEC

JARDIN BOTÁNICO DE ACLIMATACIÓN (*Discontinued*)

Chapultepec, Mexico, D. F.

Established: 1923. *Area*: 7 hectares.*Director*: A. L. Herrera (1923—).

Serves as a public park. Open free, daily, 7 to 17 (7 a.m. to 5 p. m.). *Source of income*: Supported by the Federal Government and the Sociedad de Estudios Biológicos. *Library*: More than 2000 books and pamphlets. *Herbarium*: Approximately 60,000 specimens. *Plantations*: arranged systematically. *Arboretum and Fruticetum*. *Publications*: Boletín de la Dirección de Estudios Biológicos. *Supplies living plants* for study to local schools.

"Unfortunately our botanic garden exists no more. The Direction of Biological Studies was destroyed [discontinued?] by the University, and I am in retirement." (*Letter of March 18, 1938, from Prof. A. L. Herrera.*)

MEXICO, D. F.

JARDIN BOTÁNICO (See Chapultepec)

SAN JUAN BAUTISTA (OR BAPTISTA)

(Formerly Villa Hermosa)

JARDIN BOTANICO "PLUTARCO ELIAS CALLES"

San Juan Bautista, Tabasco

Established: September 1925. *Area*: "1 Ha. 52 A. 62' 9C."*Director*: Camelo G. Joaquin (January 18, 1926—).

Serves as a public park. Open free daily. *Income*: Government appropriations. *Library*: The Director's library, containing about 1500 books. *Herbarium*: The Instituto "Juarez," containing about a thousand specimens. *Plantations*: Systematic, economic, ornamental; *Arboretum and Fruticetum*. *Special lectures* given occasionally. *Living study material*: Supplied occasionally to schools. *Affiliated* with the Instituto "Juarez."

Netherlands

AMSTERDAM

HORTUS BOTANICUS

Plantage Middenlaan 2

Established: 1682. *Area:* 4 acres.*Directors:* First a Board of Administration. Since 1877, Directors.

1. Cornelis Antoon Jan Abraham Oudemans (1877–1896)
2. Hugo de Vries (1896–1918)
3. Eduard Verschaffelt (1918–1923)
4. Theodoor Jan Stomps (1923–)

Open to the public daily. Admission fl. 0.50 (20c or 25c), but only fl. 0.25 on Sundays and Wednesdays and Saturday afternoon. *Source of income:* Annual appropriations by the municipality. *Annual Budget:* (1938): fl. 3035 (without salaries, coal, water, gas, electricity), and fl. 1700 for the library. The laboratories also have their own appropriations, fl. 3400. *Library:* Reference only. *Herbarium:* Contains, first, control specimens for the plants of the garden, then, an almost complete collection of Holland and several local collections of the Netherlands East Indies and other regions. *Plantations:* Systematic, experimental. *Publication:* Seed List. *Museum:* Has a large collection of fungi. *Instruction:* Regular university courses are given at the garden. *Affiliations:* The garden is a university institution with 2 laboratories: a. botany in general; b. plant physiology.

BAARN

BOTANISCHEN TUIN "CANTONSPARK" TE BAARN

(CANTONSPARK, BOTANIC GARDEN OF THE STATE UNIVERSITY OF UTRECHT)

Cantonspark, Javalaan 49–51

Established: November 16, 1920. *Area:* 4 Ha.*Director:* August Adriaan Pulle (1920–).

Serves as a public park two days a week (in summer three). Admission free, Monday, Wednesday and Thursday 9–12 and 2–5. *Source of income:* Budget of the State Department of Education. (Arts and Sciences.) It is the Property of the State. *Library:* That of the Botanical Museum and Herbarium of the University of Utrecht. *Herbarium:* That of the Botanical Museum and Herbarium of the University Utrecht. *Plantations:*

Systematic and mixed. *Arboretum and Fruticetum*. There is a phytopathological section. *Publication*: Seed List (Zaadlijst). *Affiliation*: The Garden at Baarn is a second botanic garden of the Rijksuniversiteit, Utrecht; the other smaller garden is in Utrecht.

DELFT

CULTUURTUIN VOOR TECHNISCHE GEWASSEN

Poortlandlaan 67

Established: March 15, 1917. *Area*: 2.5 ha.

Director: Gerrit van Iterson, Jr. (1917–).

Open free on workdays, 9 to 12 a.m., 2 to 6 p.m. *Source of income*: Grants from the Government Treasury. *Library*: 4000 volumes, 6000 pamphlets. *Herbarium*: 17,000 specimens. *Plantations*: Partly systematic, partly economic. *Publications*: Seed List, Guide to the economic plants in the greenhouses. *Museum*: For technical and economic plants in the laboratory. Free for students. *Supplies living material* for study in local schools. *Affiliation*: Laboratory for Technical Botany of the Technische Hoogeschool, Delft. (Laboratorium voor Technische Botanie en Cultuurtuin van de Technische Hoogeschool.)

GRONINGEN (1)

HORTUS BOTANICUS GRONINGANUS

Groote Rozenstratte 31

Established: 1642. *Area*: 1.5 hectares.

Directors:

1. Henricus Munting (1642–1654)
2. Abraham Munting (1658–1683)
3. Albert Munting (1686–1694)
4. Rudolphus Eyssonius (1695–1705)
5. Theodorus Muyckens (1706–1721)
6. Jacob Hendrik Croeser (1724–1753)
7. Tiberius Lamberer (1754–1763)
8. Petrus Camper (1764–1773)
9. Wynaldus Munniks (1774–1806)
10. Petrus Driessen (1806–1826)
11. Hermann Christian van Hall (1826–1871)
12. Petrus de Boer (1871–1890)
13. Jan Wilhelm Moll (1890–1917)

14. Johannes Cornelis Schoute (1917–1931)

15. Willem Hendrik Arisz (1931–)

Open daily. Admission 25 cents; Tuesdays 2 to 4 p.m. free. *Source of income*: Appropriations from the state. *Library*: In the Botanical Laboratory. About 1500 books; 227 periodicals received. *Herbarium*: 100,000 specimens. *Plantations*: Ecologic and systematic. *Publication*: Index Seminum. *Museum* in the Laboratory, not open to the public. *Supplies living study material* to local schools. *Affiliation*: Belongs to the University of Groningen. See Groningen (2).

GRONINGEN (2)

HORTUS BOTANICUS DE WOLF

Location: Haren (Groningen) Rijksstraatweg

Address: Botanisch Laboratorium, Groote Rozenstraat 31

Established: 1918. *Area*: 12 hectares, of which 5 hectares are in culture (1938).

Director: Willem Hendrik Arisz (1918–1931).

Does not serve as a public park. Belongs to the University of Groningen.

HARTECAMP

CLIFFORD'S GARDEN

George Clifford (1685–1760), a director of the Dutch East India Company, "formed a famous botanic garden with museum and library at Hartecamp," three miles from Haarlem.

Linnaeus resided with Clifford in 1735. The herbarium was arranged and written up by Linnaeus under the title, *Hortus Cliffortianus*. 3000 species of this collection (thirteen sheets of which bear notes in handwriting of Linnaeus) forming the types of this work are now in the Herbarium of the British Museum. (*Fide*. British Mus. (Nat. Hist.) Dept. Bot., Exhibition of a selection from the historical collections. Fifth International Bot. Congress, 1930. London, p. 13.)

laboratory and the garden, and a curator for the Garden. (See also Baarn.)

WAGENINGEN

ARBORETUM VAN DE LANDBOWHOOGESCHOOL TE WAGENINGEN
(ARBORETUM OF THE STATE AGRICULTURAL COLLEGE)

To avoid all errors address only—Arboretum, Wageningen, Holland.

Director: J. Jeswiet (1936).

Publications: Mededeelingen van het Arboretum van de Landbouwhoogeschool te Wageningen. (Begun in 1936.) Catalogue de Graines.

Netherlands East Indies

See Java and Sumatra

New Guinea (British)

RABAUL

RABAUL BOTANIC GARDENS

Established: 1910. "Some plants were introduced to a plant garden in 1906–7, probably at Kokopo; later transferred to Rabaul," on New Britain Island.

Area: 111 hectares, of which 26 hectares are under cultivation.

Directors:

1. Dr. Gehrmann (1910–1914)
2. Howard Newport, acting (1914–1923; 1926–1927)
3. G. Bryce (1923–1926)
4. George H. Murray (1928–)

Serves as a public park. Open free daily at all hours. *Source of income:* Administration of the Mandated Territory of New Guinea, plus a small income from sale of plant materials. *Library:* That of the Department of Agriculture. Over 900 books, not including bound periodicals and pamphlets. *Herbarium:* "1000 covers." *Plantations:* Systematic, economic. *Arboretum* ("in the general sense, but it is not used for systematic work"). *Fru-ticetum.* *Publications:* Plant lists, previously published, have been discontinued. *Museum:* Small; open, 8 a.m. to 3:30 p.m.

14. Johannes Cornelis Schoute (1917–1931)

15. Willem Hendrik Arisz (1931–)

Open daily. Admission 25 cents; Tuesdays 2 to 4 p.m. free. *Source of income*: Appropriations from the state. *Library*: In the Botanical Laboratory. About 1500 books; 227 periodicals received. *Herbarium*: 100,000 specimens. *Plantations*: Ecologic and systematic. *Publication*: Index Seminum. *Museum* in the Laboratory, not open to the public. *Supplies living study material* to local schools. *Affiliation*: Belongs to the University of Groningen. See Groningen (2).

GRONINGEN (2)

HORTUS BOTANICUS DE WOLF

Location: Haren (Groningen) Rijksstraatweg

Address: Botanisch Laboratorium, Groote Rozenstraat 31

Established: 1918. *Area*: 12 hectares, of which 5 hectares are in culture (1938).

Director: Willem Hendrik Arisz (1918–1931).

Does not serve as a public park. Belongs to the University of Groningen.

HARTECAMP

CLIFFORD'S GARDEN

George Clifford (1685–1760), a director of the Dutch East India Company, "formed a famous botanic garden with museum and library at Hartecamp," three miles from Haarlem.

Linnaeus resided with Clifford in 1735. The herbarium was arranged and written up by Linnaeus under the title, *Hortus Cliffortianus*. 3000 species of this collection (thirteen sheets of which bear notes in handwriting of Linnaeus) forming the types of this work are now in the Herbarium of the British Museum. (*Fide*. British Mus. (Nat. Hist.) Dept. Bot., Exhibition of a selection from the historical collections. Fifth International Bot. Congress, 1930. London, p. 13.)

LEIDEN

HORTUS BOTANICUS ACADEMICUS LUGDUNO-BATAVUS

Hortus Botanicus Nonnensteeg 3

Established: April 13, 1587. *Area:* 2 hectares.*Directors:*

1. G. de Bondt (Bontius) (1587–1593)
2. Carolus Clusius [Charles de l'Écluse (l'Écluse)] (1593–1609)
3. Peter Paaw (1609–1617)
4. Eberhard Vorstius (Van Voorst) (1617–1624)
5. Adolphus Vorstius (Van Voorst) (1624–1663)
6. Florentius (Florentinus) Schuyt (1663–1670)
7. Arnold Syen (1670–1678)
8. Paul Hermann (1679–1695)
9. Petrus Hotton (1695–1709)
10. Hermann Boerhaave (1709–1731)
11. Adrian Van Royen (1731–1754)
12. David Van Royen (1754–1786)
13. Sebald Justin Brugmans (1786–1819)
14. Caspar Georg Carl Reinwardt (1819–1845)
15. Willem Hendrik de Vriese (1845–1862)
16. Willem Frederik Reinier Suringar (1862–1893)
17. Jacobus Marinus Janse (1899–1930)
18. Lourens Gerhard Marinus Baas Becking (1930–)

Open free, daily, April 1 to October 1, from 9–6; October 1 to March 31, from 9–4. Sundays in summer, 10–4. October 1 to March 31, not open on Sundays. *Sources of income:* Endowment; annual appropriations by national government. *Library:* In the botanical laboratory. *Plantations:* Systematic (following Eichler), ecologic, pharmaceutic. *Arboretum.* New plant-houses in course of construction. Total number of species \pm 9000. *Publications:* Seed List; Communications of the Leiden Botanical Garden. *Affiliation:* The State University, Leiden. *Note:* Alphonse Lavallée states that “the first greenhouse” was established at Leiden in 1599, “for the protection of some plants introduced from the Cape of Good Hope, Geraniums, Mesembryanthemums, etc. It contained, according to Boerhave, nearly 6000 plants.”

Sir William Brereton (Travels in Holland, London, 1844) states that this Garden is one of only two things “memorable” about the University of Leiden. He describes how Adolphe Van Voorst gave his lectures in this Garden “very fluently” in Latin.

"His manner is to take a whole bed, four yards long and one broad, and to discourse of the nature and quality of every herb and plant growing therein, which he points out with his staff when he begins to speak thereof."

Clusius is said to have been the first professor of botany to do planting in the Leiden garden, which contained more than 1000 species and varieties in September 1594. Of these, one tree, a Laburnum, still standing in 1935, had a circumference of 16 feet 4 inches at the base and a height of 57 feet.

ROTTERDAM

BOTANICAL SECTION OF THE ZOOLOGICAL GARDEN

Seed List (1937).

UTRECHT

HORTUS BOTANICUS

L. Nieuwstraat 106

Established: End of the 17th or beginning of the 18th century.

Area: 1 hectare.

Directors:

1. Cornelis Adriaan Bergsma (d. 1859)
2. Friedrich Anton Wilhelm Miquel (1861–1871)
3. Nicolaas Willem Pieter Rauwenhoff (1871–1896)
4. Frederich August Ferdinand Christian Went (1896–1934)
5. Victor Jacob Koningsberger (1934–)

Open free to the public daily from 9 a.m.–4 or 5 p.m. *Source of income:* Annual appropriations by the national government. *Library:* About 8500 volumes (periodical volumes included), and about 3000 pamphlets. The Library of the Herbarium is combined with that of the Laboratory and garden. *Herbarium:* The *Herbarium*, established by Miquel (1861–1871), has about 200,000 specimens. It forms a distinct department together with the Botanical Museum under the directorship of the Professor of Systematic Botany. There is a conservator for the herbarium. The herbarium receives an independent appropriation from the government. *Publications:* Mededeelingen van het Botanisch Museum en Herbarium. Catalogue des Graines. *Plantations:* Systematic, with a small rockery. Specimens under glass: 3500. Herbaceous plants out-of-doors: 1000 species. *Affiliations:* The Garden, together with the Botanical Laboratory, is a department of the Rijksuniversiteit, Utrecht. All instruction is given by the botanical staff of the University. There is a director for both the

laboratory and the garden, and a curator for the Garden. (See also Baarn.)

WAGENINGEN

ARBORETUM VAN DE LANDBOWHOOGESCHOOL TE WAGENINGEN
(ARBORETUM OF THE STATE AGRICULTURAL COLLEGE)

To avoid all errors address only—Arboretum, Wageningen, Holland.

Director: J. Jeswiet (1936).

Publications: Mededeelingen van het Arboretum van de Landbowhoogeschool te Wageningen. (Begun in 1936.) Catalogue de Graines.

Netherlands East Indies

See Java and Sumatra

New Guinea (British)

RABAUL

RABAUL BOTANIC GARDENS

Established: 1910. "Some plants were introduced to a plant garden in 1906–7, probably at Kokopo; later transferred to Rabaul," on New Britain Island.

Area: 111 hectares, of which 26 hectares are under cultivation.

Directors:

1. Dr. Gehrman (1910–1914)
2. Howard Newport, acting (1914–1923; 1926–1927)
3. G. Bryce (1923–1926)
4. George H. Murray (1928–)

Serves as a public park. Open free daily at all hours. *Source of income:* Administration of the Mandated Territory of New Guinea, plus a small income from sale of plant materials. *Library:* That of the Department of Agriculture. Over 900 books, not including bound periodicals and pamphlets. *Herbarium:* "1000 covers." *Plantations:* Systematic, economic. *Arboretum* ("in the general sense, but it is not used for systematic work"). *Fru-ticetum.* *Publications:* Plant lists, previously published, have been discontinued. *Museum:* Small; open, 8 a.m. to 3:30 p.m.

New Zealand

CHRISTCHURCH

CHRISTCHURCH BOTANIC GARDENS

Established: 1861. *Area:* 52 acres.

Directors:

1. T. Barker (1864–1867)
2. J. F. Armstrong (1867–1889)
3. A. Taylor (1889–1907)
4. J. Dawes (1907–1908)
5. J. Young (1908–1933)
6. J. A. McPherson (1933–)

Serves partly as a public park. Open from sunrise to sunset. *Source of income:* By rating areas (10 miles radius from Chief Post Office). *Library:* Approximately 125 volumes and 300 pamphlets. (Proposals are on foot to build proper library accommodation together with laboratory and lecture room). *Supplies living material* for study to local schools. *Note:* The Garden is a recognized training ground for Horticultural Students wishing to sit for the National Diploma of Horticulture (N. Z.). Classes are held among the living specimens, and the period of training is limited to five years. (Both boys and girls are taken on as trainees.) There is at present a proposal before the Government for the enlargement of this activity.

DUNEDIN

DUNEDIN BOTANICAL GARDENS

In 1878 this Garden was brought under the Public Domains Act of 1860 and placed under the control of a board of seven members. In 1884 this plan was terminated and the control vested in the Dunedin City Council. *Plantations:* Special section for indigenous plants.

WELLINGTON (1)

BOTANIC GARDEN

Established: 1870 (*Nature*, Nov. 6, 1919, p. 263).

WELLINGTON (2)

OTARI OPEN-AIR NATIVE PLANT MUSEUM

Established about 1930–31 by Dr. L. Cockayne and Mr. J. G. Mackenzie. Native plants are grouped on an ecological basis.

Nigeria

IBADAN

(BOTANIC GARDENS DISCONTINUED)

Director of Agriculture, Ibadan, Southern Nigeria

The following statement was received on October 30, 1913, from the Director of Agriculture:

"In reply to your circular letter of 1st September 1912, I have the honor to inform you that the *two botanic gardens* "*Ebute Metta*" and "*Calabar*," which previously existed in Southern Nigeria have been converted into Economic Gardens and are controlled from this office. Strictly speaking, no Botanic Gardens now exist in Southern Nigeria."

North Africa

ALGER

JARDIN BOTANIQUE DE L'UNIVERSITÉ D'ALGER

Established: 1887. *Area:* About 3 hectares.

Directors: 1. Louis Trabut (1887–1923); 2. René Maire (1923–).

Open every day from 8 to 12 and from 2 to 5 for students and authorized travelers. Admission free. *Source of income:* Budget of the University. *Library:* About 10,000 volumes and pamphlets. *Herbarium:* About 300,000 specimens. *Arboretum:* Inaugurated in 1935. *Plantations:* Systematic. *Publication:* Index Seminum.

Norway

AAS

BOTANIC GARDEN OF THE COLLEGE OF AGRICULTURE

Norge Landbrukshöiskole

BERGEN

BERGENS MUSEUMS BOTANISKE HAVE

Established: 1897. *Area:* "Quite small."

Directors:

1. Jørgen Brunchorst (1897–1906)
2. Jens Holmboe (1906–1925)
3. Rolf Nordhagen (1925–)

Serves as a public park. Open daily from 7 a.m. to 11 p.m. *Source of income:* Annual appropriations from the state and from the city. *Publication:* "Forschungen aus dem Botanischen Garten in Bergen." *Notes:* "During the years 1926–1930 the present director succeeded in enlarging the grounds considerably. It is still the only botanic garden in Western Norway and contains about 2500 species of hardy plants cultivated in the open and systematically arranged in natural families, but also freely arranged in rock-grounds, pools, etc." "As the climate in Bergen is very mild, a lot of evergreen shrubs, conifers, and perennials can be grown in the open which otherwise do not thrive well in Scandinavia. (Rhododendrons, Azaleas, Ligustrums, Skimmias, *Araucaria araucana*, *Cryptomeria japonica*, Bamboos, *Solanum crispum*, *Olearia Haastii*, Buddleias, *Griselinia littoralis*, Pernettyas, species of *Erica* and many perennial herbs and bulbs from warmer regions as *Roscoea cauleoides* and *purpurea*, *Meconopsis Baileyi*, *Gentiana Farreri*, Trilliums, Kniphofias, Cypripediums, *Iris reticulata*, *Calochortus albus*, *Narcissus bulbocodium*, etc.) The Garden has a modest conservatory for educational purposes. Courses of lectures are given at the Museum for students of natural science and archeology." 1938 *Note:* The director has added the following: "Belongs to the *Department of Systematic Botany*, which consists of 1. The Garden, 2. Herbarium and exhibitions (with public entrance), 3. Rooms for scientific work."

OSLO

UNIVERSITETETS BOTANISKE HAVE

Universitetets Botaniske Museum

Established: 1814. *Area:* (1938): 136,000 square meters.

Directors:

1. Christen Smith (1814–1816)
2. Jens Rathke (1816–1843)
3. Matthias Numsen Blytt (1843–1862)
4. Frederik Christian Schübeler (1864–1892)
5. Johan Nordal Fischer Wille (1893–1924)
6. Jens Holmboe (1925–)

Serves as a public park. Open free, daily, in summer from 7 a.m.–10 p.m. *Source of income:* Government appropriation. *Annual Budget* (1937–1938): 38,000 Norwegian crowns (kroner), excluding fuel and salaries to director, gardeners, and assistant. *Library:* About 9000 volumes. Periodicals currently received about 300. *Arboretum and Fruticetum* are combined. Number

of trees and shrubs, about 1800 (about 500 species). *Plantations*: Systematic, geographic, economic. *Species under glass*: About 2500. *Herbaceous plants out of doors*: About 4000 species. *Publications*: Jointly by the Garden and the Museum: "Nyt Magazin for Naturvidenskaberne." Annual Seed List. *Museum*: Erected in 1913. *Lectures*: No public lectures are given at the Garden, but students from various schools and the University are given regular instruction and demonstrations. *Affiliations*: The Royal Frederic University, Oslo.

TROMSÖ

"The Garden of Tromsö is not a botanical garden in the strict sense of the word. It is more particularly a park, wherein, besides ornamental plants, stress is laid upon the planting of indigenous timber and bushes. The museum has a botanical section, including a herbarium, and specimens of the vegetation of northern Norway. There is no special director or custos for the botanical division." (*Fide C. Dons, custos, Div. Nat. Hist.*)

Palestine

JERUSALEM

BOTANICAL GARDEN OF THE HEBREW UNIVERSITY MONTAGUE
LAMPOR MEMORIAL
P. O. Box 340

Established: 1932. *Area*: 3¼ hectares.

Director: In charge, Dr. Alexander Eig, Dept. of Botany, Hebrew University. (Deceased, July 30, 1938.)

Source of income: University budget (special Lamport fund). *Library*: 1250 volumes; about 1200 separata. *Herbarium*: 140,000 specimens. *Plantations*: Geographic, ecologic. *Museum*: University collections of Palestinian fruits, vegetables and woods. Museum of Biblical Botany and Plant-lore. Free admission.

Paraguay

ASUNCIÓN

JARDIN BOTÁNICO

The botanic garden often listed as at Asunción is located at Santísima Trinidad, which see. (*Fide*. Consul General of Paraguay at New York.)

SANTISIMA TRINIDAD

JARDIN BOTÁNICO

Director: Juan B. Jiminez (1936). Santísima Trinidad is a small town about ten kilometers south of Asunción, along the Paraguay River. The botanist at the Garden is Teodoro Rojas (1938).

Publication: Revista del Jardin Botánico y Museo de Historia Natural. Affiliated with the national university of Paraguay.

Peru

LIMA

JARDIN BOTÁNICO DE LA FACULTAD DE CIENCIAS

Philippine Islands

MANILA

THE FIRST AND NOW EXTINCT BOTANIC GARDEN

Established: Before 1787(?).

Note: E. D. Merrill (Philippine Jour. Sci. 7: 363–369. Dec. 1912) gives evidence that there was a botanic garden in existence in the city of Manila at the time of the arrival of the Malaspina Expedition (left Cadiz, Spain, July 30, 1789; arrived in Manila March 27, 1792). Antonio Pineda was the naturalist of this expedition and died in June, 1792. James Britten (Biographical Notes XXX.—L. A. Deschamps and F. Noronha *Jour. Bot.* 41: 282–285. 1903) states that the Spaniards erected a monument to their countryman, Dr. Noroña, “in the island of Luzon, near Manila, on ground belonging to the royal botanic garden which . . . Dr. Noroña had done everything in his power to bring into order, and to stock with many valuable plants.” Since Noroña died in 1787, this is evidence that the botanic garden existed before the Malaspina Expedition arrived. There is little doubt, says Merrill, that a monument to Pineda was erected in 1792 in what was at that time the Botanic Garden, in the same tract with the Noroña monument, “located outside the city of Manila, as the city was constituted from 1780 to 1800.” As to when and why this garden was abandoned we have no record. The area was, after the

American occupation, the site of the experiment station of the Philippine Bureau of Agriculture.

THE SECOND BOTANIC GARDEN (*Now a Park*)

"In 1858 a Botanical Garden was established in Manila within the zone of fortifications of the Walled City. Its area was but about 5 hectares. The first Director was Francisco Ramos, the second, Zoilo Espejo, the third Inocencio Madrigal, none of them of any eminence as botanists. In 1873 Domingo Vidal was given charge of the gardens in addition to his duties as Director of the Forestry Bureau. On his death in 1878, he was succeeded in both positions by Sebastian Vidal, who retained the position until his death in 1889.

"The garden, as such, never amounted to very much due to the restricted area and unsuitable location. After Vidal's death no attempt was made to develop it, but it was maintained as an Institution until the American occupation in 1898. Since 1898 . . . maintained as a public park." (*Letter from E. D. Merrill.*)

Poland

CRAKOW

BOTANIC GARDEN OF THE JAGIELLONIAN UNIVERSITY
(OGRÓD BOTANICZNY UNIWERSYTETU JAGIELLÓŃSKIEGO)

Ul. Kopernika 27

Established: 1783. *Area:* 7 hectares.

Directors:

Joseph August Schultes (1806)

Josef von Rostafinski (1876–1912)

Maryan Raciborski (1912–1917)

Wladyslaw Szafer (1917–)

Serves as a public park. Open free daily, 8 a.m. to 9 p.m.
Source of income: Budget of the University. *Library:* 3000 volumes, about 4000 pamphlets. *Herbarium:* 100,000 specimens. *Plantations:* Systematic, geographic, economic, morphologic, ecologic. *Arboretum.* *Fruticetum.* *Publication:* Index Seminum. *Lectures to school children* are given occasionally at the Garden. *Study material* occasionally supplied to schools.

KÓRNIK

THE KÓRNIK GARDENS AND ARBORETUM
(OF NATIONAL FOUNDATION, KÓRNIK INSTITUTES)
(OGRODY KÓRNICKIE)

Gardens and Arboretum, Kórnik near Poznań

Established: 1926. *Area:* 52 hectares (130 acres).

Director: Antoine Wróblewski, since 1926.

Serves as a public park. Open daily from 8 a.m. to twilight. Admission, 10 cents. *Source of income:* Agricultural and forest property, area of 19,661 hectares. The Garden does not receive annual governmental appropriations. *Library:* 1270 volumes. *Herbarium:* 2000–4000 numbers. *Arboretum:* 25 hectares. *Fru-ticetum:* 5 hectares. Pomological Garden: 14 hectares. Nur-series: 8 hectares. *Publication:* Catalogue des Graines d'Arbres et d'Arbustes. *Museum:* Museum dendrologicum (not yet open).

The National Foundation of Kórnik Institutes has organized, on the strength of an Act of Parliament, an Institute for Research in Dendrology and Forestry. This Institute will carry on scientific research work on all sorts of forest, fruit, park, and other trees, with regard to their life, structure, anatomy, geographical distribution, acclimatization, cultivation, and uses of all sorts. The Institute consists of three sections, viz: Dendrology and Pomology, with the Gardens and Arboretum; Forest Biology; Forest Technology. At present the organized sections are Dendrology and Pomology, with the Gardens and Arboretum.

LWÓW (LÉOPOL) (1)

BOTANIC GARDEN OF THE JEAN KASIMIR UNIVERSITY
(OGRÓD BOTANICZNY, UNIWERSYTETU JANA KAZIMIERZA)

Established: About 1855.

This Garden (the "old Garden"), at Ul. Długosza 4, is now (1938) in process of "slow liquidation and contains only some greenhouses and a small arboretum." (See *Lwów* (2).)

LWÓW (LÉOPOL) (2)

OGRÓD FLORY POLSKIEJ (GARDEN OF FLORA OF POLAND)

Ul. rotm. Dunin-Wąsowicza 54

Established: 1907. *Area:* 3.5 hectares.

Belongs to the State and derives all its income from Government. The street was formerly called Cetnerowska.

Directors:

1. Teofil Ciesielski (1907–1917)
2. Directorship vacant (1917–1924)
3. St. Kulczynski (1924–)

Open free to the public, 7 a.m. to 6 p.m. Source of income: University Jean Casimir, and government appropriations. *Library:* In Botanical Institute and Library of the University. *Herbarium:* About 60,000 specimens. *Plantations:* Ecologic. *Arboretum and Fruticetum* of Polish species only. *Publication:* *Catalogus plantarum in horto cultivatarum* (since 1933). *Museum:* Under organization. *Lectures* are given to school children at the garden. *Study collections* and living material are occasionally supplied to schools. *Affiliation:* With the Institute of Plant Morphology and Systematic Botany of the University.

POZNAN (1)

HORTUS BOTANICUS POSNANIENSIS

(OGRÓD BOTANICZNY POZNANIU)

Dabrowskiego 165, W. Poznan

Director: A. Wodziczko (1936). *Selectus Seminum* (Wykaz Nasion).

POZNAN (2)

JARDIN BOTANIQUE DE L'UNIVERSITÉ

Matejiki 5, Poznan

Seed List.

WARSAW (WARSZAWA)

HORTUS BOTANICUS UNIVERSITATIS J. PILSUDSKII VARSOVIAE

(OGRÓD BOTANICZNY UNIWERSYTETU J. PILSUDSKIEGO)

Al. Ujazdowskie 6/8

Director: B. Hryniewiecki (1937). *Index Seminum.*

WILNO (1)

BOTANICAL GARDEN OF THE UNIVERSITY

Zakret, al Zakretowa 1

Director: Józef Trzebiński.

WILNO (2)

HORTUS MEDICINALIS UNIVERSITATIS BATOREANAE

(OGRÓD ROSLIN LEKARSKICH U. S. B.)

Institut de Pharmacognosie, Objazdowa 2

Established: 1922. *Area:* 6 hectares.*Director:* Jan Muszyński (1922–).

Not open to the general public. Open to students daily, 9 a.m. to 3 p.m. *Source of income:* Budget of the University, 3000 zloty (\$600 ±) in 1938. *Library* (in Institute of Pharmacy), 2500 volumes. *Herbarium:* About 4000 specimens. *Arboretum* being established (1938). *Plantations:* Medicinal and other economic plants. *Publication:* Index Seminum, etc., since 1923, chiefly seeds of medicinal plants. *Museum* of Institute of Pharmacy, open to students only. *Supplies living plants* for study in local schools. *Note:* "U. S. B.," in the name, means "Unwersytetu Stefana Batorego" ("University of Stephan Batory," founder of the University in 1578).

Portugal

COIMBRA

JARDIM BOTÂNICO DA UNIVERSIDADE

(INSTITUTO BOTÂNICO DR. JÚLIO HENRIQUES)

Instituto Botânico, Faculdade de Ciências

Established: 1772 (1773?). *Area:* 13 acres.*Directors:*

1. Domingos Vandelli (1773–1791)
2. Félix de Avellar Brotero (1791–1811)
3. António José das Neves e Mello (1811–1834)
4. José de Sá Ferreira Santos do Valle (1834–1840)
5. António Rodrigues Vidal (1840–1854; 1858–1872)
6. Henrique do Couto Almeida Valle (1854–1857)
7. Júlio Augusto Henriques (1873–?)
8. Luis Wittnich Carrisso (1937)
9. José Custódio de Moraes (1938)

Serves as a public park. Open free, daily, 10 a.m. until sunset. *Source of income:* Budget of the State. *Library:* 22,000 volumes and pamphlets. *Herbarium:* 150,000 specimens. *Plantations:* Systematic and ecologic. *Arboretum and Fruticetum.* *Publications:* Boletim da Sociedade Broteriana; Memórias da Sociedade Broteriana; Anuário da Sociedade Broteriana; Index Seminum. *Museum:* Open free two hours daily. *Study collections* are loaned to the school children and also living material.

LISBOA (1)

JARDIM BOTÂNICO DA FACULDADE DE CIENCIAS DE LISBOA

Established (Re-established): 1873 (1876?). *Area:* 4 (7?) hectares.

Directors:

1. João de Andrade Corvo (1858 [1876?]-1890)
2. Conde de Ficalho (1890-1903)
3. António Xavier Pereira Coutinho (1903-1921)
4. Ruy Telles Palhinha (1921-)

Serves as a public park. Open free daily, 9 a.m. to 5 p.m. in winter; until 8 p.m. in summer. Museum open, by permit, 11 a.m. to 4 p.m. except Sundays and holidays. *Source of income:* The national budget. *Library:* Approximately 2400 volumes, 1200 pamphlets. *Herbarium:* About 110,000 specimens. *Plantations:* Changed, 1938, from systematic to ecologic. *Publication:* Delectus Seminum. *Supplies study material* to schools.

LISBOA (2)

JARDIM COLONIAL

Lisboa (Belém)

Established: 1908. *Area:* 5 hectares.

Directors: 1. José Joaquim de Almeida (1908-October, 1932); 2. Bernardo d'Oliveira Fragateiro (acting during absence of de Almeida in the Portuguese colonies); 3. Bernardo d'Oliveira Fragateiro (Oct. 1932-).

Open free to the public daily, 11 a.m. to 7 p.m. *Source of income:* The Portuguese colonies. *Library:* 1226 items. *Herbarium:* approximately 14,000 specimens. *Plantations:* Economic. *Publication:* Memoranda do Jardim Colonial. The *Museu Agrícola Colonial* is in the same building that serves the Garden, but under another director. *School Classes* visit the Garden in large numbers under guidance of a docent. Collections of tropical eco-

onomic plants are supplied to agricultural schools; plant products are supplied by the Museum. The purpose of the Garden is "to instruct the Colonial Students of Agronomy in Colonial Agriculture. *Affiliation*: "With the Instituto Superior de Agronomia in pedagogic matters." The director of the Garden is the professor of Colonial Cultures in that school.

LISBOA (3)

JARDIM BOTÂNICO DA AJUDA

Ajuda is a suburb about two miles west of Lisbon. After the earthquake of 1755 this area was converted into a culinary plant garden and fruit orchard and a temporary royal residence for King Dom José. After the residence (of wood) was destroyed by fire Marquês de Pombal, a philanthropist, had the area laid out as a botanic garden ("a living example of botany"). The first curator, Domingos Vandelli, was followed by Félix de Avelar Brotero. At a later period José Maria Grande, Welwitsch, Andrade Corvo, and the Count of Ficalho attempted to revive the garden "but it never again became what it had been under Brotero." During the last quarter of the 19th century it became the property of the Royal House and was converted into a "private promenade." Since the proclamation of the Republic it has again become a public "Botanic Garden." Annexed to it is the Institute of Science (Faculdade de Ciências). (*Fide*: Guia de Portugal Artístico. Vol. II. Lisbon. 1935.)

Roumania

BUCUREȘTI (1)

GRĂDINA BOTANICĂ

Grădina Botanică, Universitatea din București

Director: M. Vladescu (?–Nov. 1936); S. St. Radian (1937–).

Plantations: Systematic; Rock Garden. Herbarium; Museum; Library. *Publication*: Catalog de Semințe.

BUCUREȘTI (2)

BOTANIC GARDEN OF THE AGRICULTURAL ACADEMY

(Grădina Botanică a Academia de Inalte Studii Agronomice)

Căsuța Poștală 207

Established: 1856. *Area:* 3 hectares.*Directors:* V. Cârnă-Munteanu; M. Brândza; T. Grințescu; Tr. Săvulescu.Not open to the public. *Source of income:* Governmental appropriations. *Plantations:* Systematic. *Arboretum.* *Fruticetum.*

CERNĂUȚI (FORMERLY CZERNOWITZ)

GRĂDINA BOTANICĂ, UNIVERSITATEA REGELE CAROL II

(BOTANIC GARDEN OF THE UNIVERSITY "REGELE CAROL II")

Str. Regele Carol II

Established: 1877. *Area:* 3 hectares, 68 ares.*Directors:*

1. Eduard Tangl (1877–1905)
2. Friedrich Czapek (1905–1910)
3. Karl Linsbauer (1910–1911)
4. Otto Porsch (1912–1918)
5. Mihail Gușuleac (1919–)

Serves as a public park. Open to adults only, daily, May 15–October 1, 8 to 12 a.m. and 2 to 8 p.m. Fee, 2 lei each time, 50 lei for the season. *Source of income:* State appropriation to the University. *Library* of Botanical Institute of the University. About 4565 volumes. *Herbarium:* About 120,000 specimens. *Plantations:* Systematic, morphologic, ecologic, local flora, phylogenetic, pharmaceutic, technical. *Arboretum.* *Fruticetum.* *Publications:* Catalog de Semințe. Bulet. Facult. Șc. Cernăuți. *Museum:* In the Botanical Institute of the University. *Study Material:* Supplies both public and private schools, when requested, with all kinds of living plant material for study. *Instruction:* Lectures and practicums are given to university students. Botanical excursions are conducted in the garden and in the field by members of the staff.

CLUJ (1)

BOTANIC GARDEN OF THE UNIVERSITY

(GRĂDINA BOTANICĂ, UNIVERSITATEA "REGELE FERDINAND I")

Str. Regala 26

Established: 1873 (Old Garden, 8 hectares). *A new Garden* was organized in 1919.

Area: The new Garden is 18 cad. jug. (cir. 10 hectares).

Directors:

- | | |
|-----------------------------|----------------------------|
| 1. A. Kanitz (1873–1897) | 4. V. Borbás (1904–1905) |
| 2. J. Istvánffy (1897–1901) | 5. St. Györffy (1905–1919) |
| 3. A. Richter (1901–1903) | 6. Al. Borza (1919–) |

Serves as a public park. Open daily from 7 a.m. until dark. *Source of income:* State Budget and private incomes for material expenses of research work, publications, material service of the Garden and Museum. *Library:* Library of the Botanical Institute (7500 volumes). *Herbarium:* Herbarium of the Botanical Museum (mounted and unmounted), approximately 630,000 specimens. *Arboretum and Fruticetum* are not separate. *Plantations:* 1. Systematic. 2. Flora of Roumania (geographical, ecological). 3. Extra-Roumanian floras and Rock Garden. 4. Morphologic-biologic groups. 5. Pomological section. 6. Economic section. 7. Officinal plant section. 8. Conservatories. 9. Japanese Garden. 10. Historical garden of Pliny. 11. Ornamental plants. The Garden has also 5 scientific natural reservations in its property: Fânațe, Suat, Zau, Băile Episcopiei, Tulghes. In 1934 it came into possession of the Botanical Station of the Botanical Garden of Cluj in the Bihor Mountains, in the climatic locality Stâna de Vale. Altitude, 1100 meters. *Publications:* 1. *Buletinul Grădinii botanice și al Muzeului bot. dela Universitatea din Cluj* (in Roumanian and international languages). Vol. I–XVII. Contains annual Catalogul de Semințe. 2. *Flora Romaniae exsiccata*, projected in 60 parts, XVI centuries have already (1938) been published. 3. Popular Leaflets. 24 numbers. 4. *Contributions Botaniques de Cluj, Roumanie*. Separate reprints. Vol. II in course. *Museum:* There is a great Botanic Museum of the University, open for the people Sunday, 3 to 5 p.m. *Study collections* to loan to schools; *supplies living matter* for study to all local schools.

CLUJ (2)

GRĂDINA BOTANICĂ DE ACADEMIA DE ÎNALTE STUDIA
AGRONOMICE DIN CLUJ

Established: About 1900. *Area:* 0.5 hectare.

Directors: Pater Béla (1900(?)–1920); Prodan (1920–).

Open daily, for students only. *Source of income:* The Agricultural College. *Plantations:* Systematic and economic.

Scotland (See Great Britain)

South Africa

CAPE TOWN

CAPE TOWN BOTANIC GARDEN

Commissioners appointed May 5, 1848, opened a subscription list, appointed as gardener a local nurseryman of the name of Draper, and laid out and planted an area assigned for their use from the Government Gardens. Governmental appropriations were meager (£7–10–per month!), and Karl Zeyher, celebrated botanical collector, appointed 1849, was dismissed the following year. Dr. Berthold Seeman, who visited the Garden in 1851, wrote that the Committee had “passed a resolution that their Botanic Garden could do without a botanist.” Toward the end of 1891, while the Garden was under Professor MacOwan, F.L.S., as Director (1880–1891), Government appropriations being wholly inadequate, the Commissioners voted to discontinue the garden as a botanical establishment and treat it as “merely a town *pleasaunce* of flowers and shady walks.” The change became effective Jan. 1, 1892. The *Kew Bulletin* (Jan. 1892) expressed the hope that at some future time a Botanic Garden might be established at the Cape under scientific control. *See Kirstenbosch.*

DURBAN (1)

MUNICIPAL BOTANIC GARDEN

Durban, Natal

Established: 1849. *Area:* 48 acres. $\frac{1}{3}$ undeveloped until recently. Part of this area laid out in 1934.

Directors: (official title Curators).

1. ——— Johnstone (1849–1850)
2. M. J. McKen (1851–1853; 1860–1872)
3. Alex. Smith (1853–1854)
4. ——— Plant (1854–1856)
5. James Weir (1856–1857)
6. R. Rogers (1857–1859)
7. ——— DeLa Chaumette (1859, 3 mos. only)
8. A. Moore (1859–1860)
- 8a. M. J. McKen, second term (1860–1872)
9. ——— Keit (1872–1881)
10. J. Medley Wood (1882–1900) as Curator. In 1900 became Director of Natal Herbarium and the Municipal Botanic Garden, which were then combined. In 1913 became Director of the Natal Herbarium. (See Durban 2.)
11. J. Wylie (1913–1917)
12. H. Rutter (1917–1930)
13. Botanic Gardens came under the direction of the Director of Parks and Gardens (Director, Mr. P. Robertshaw, 1930–1932).
14. F. W. Thorns (Officer in charge of Botanic Gardens, 1932–?)
15. P. Robertshaw (1936)

Serves as a public park. Open free to the public daily from 7:30 a.m. to 6 p.m. Children under ten years of age are not admitted unless “accompanied by a competent protector.” *Source of income:* Maintained by the Corporation of Durban as a section of the Parks and Gardens Department. Direct income—nil. *Herbarium:* (See Natal Herbarium and Plant Pathological Station.) *Scientific publications:* Natal Plants, Vol. 1 by Wood and Evans; Vols. 2–5 by J. Medley Wood. Each vol. of 100 plates and descriptions. *Study material* is furnished occasionally to public schools when requested. Formerly combined with the Natal Herbarium, but taken over in 1913 by the Municipality. (See Durban 2.)

DURBAN (2)

THE NATAL HERBARIUM AND PLANT PATHOLOGICAL STATION Durban, Natal

Established: 1913. Taken over by the Government of the Union of South Africa in 1913 and given its present name. It is an

out station of the Division of Plant Industry, Department of Agriculture. *Was formerly combined with the Botanic Garden.* (See Durban 1.)

Directors: J. Medley Wood (1913–1915); P. A. van der Bijl, Mycologist-in-charge (1915–1921); H. H. Storey, Mycologist-in-charge (1922–1928); A. P. D. McClean, Mycologist-in-charge (1928–).

A collection of many type specimens of species brought together by Dr. J. Medley Wood is housed here, and is open to the public. The determination of plants is undertaken for inquirers.

Source of income: Appropriations by the Union of S. Africa Government. *Herbarium:* 39,000 foreign, 30,000 South African specimens. *Note:* A quarantine greenhouse of modern type has been built by the South African Sugar Association at the Herbarium, and in this building new varieties of sugar cane, imported from foreign countries, are grown under conditions of strict isolation and inspection by Government officers. The pathological laboratory undertakes the examination of diseases of any crops, but its activities have, in recent years, mainly centered round the group of virus diseases of plants. Investigations of streak disease of sugar cane and maize, of mosaic of the same host plants and of rosette disease of peanuts have shown them to be transmitted under local conditions by particular insects. This institution has a special experimental ground adjacent to the building and is equipped with insect-proof greenhouses for the study of plant virus diseases (e.g., streak disease of maize and sugar cane; bunchy top disease of tomato; leaf-curl disease of tobacco).

GRAHAMSTOWN

MUNICIPAL BOTANIC GARDEN

Grahamstown, Cape Province

Established: 1853. *Area:* 50 acres.

Directors (Curators):

1. E. J. Alexander (1897?–1927?)
2. E. Lever (1927?–1936)
3. A. W. Maynard (Dec. 1936–)

Serves as a public park. Open free daily, from sunrise to sunset. *Source of income:* Municipal grants; sale of plants. *Library:* Small (in the curator's office). *Plantations:* Geographic, economic. *Arboretum.* *Museum* near the Garden. Open free daily, 9 a.m. to 5 p.m. Loan collections and living study material supplied to schools. *Affiliation:* Rhodes University College.

KIRSTENBOSCH

NATIONAL BOTANIC GARDENS OF SOUTH AFRICA

(Headquarters) Kirstenbosch, Newlands, C. P.

Includes two gardens, viz: (1) Kirstenbosch; (2) The Karoo Garden, Whitehill, C. P. (near Matjesfontein). See under Whitehill.

Established: 1913. *Area:* Including Upper Kirstenbosch Nature Reserve, approximately 1100 acres.

Directors:

1. Henry Harold Welch Pearson (1913–Nov., 1916)
2. Directorship vacant (1917–1918)
3. Robert Harold Compton (March, 1919–).

Open free to the public during daylight every day of the year. *Source of income:* The funds of Kirstenbosch are derived from: (1) grants made by the Union Government, the Cape Town Corporation, the Cape Provincial Council, and the Cape Divisional Council; (2) private benefactions, either direct or through the Botanical Society; (3) sales and miscellaneous. *Library:* Small reference. *Herbarium:* Now being established. *Species under cultivation:* Exact number not available, but some thousands, almost entirely South African indigenous plants, with some hundreds of exotic plants of economic importance. *Affiliation:* The Botanical Society of South Africa, of some 1900 subscribing members, was established in 1913 “primarily to give general and financial support to the work of Kirstenbosch.” Members of the Society enjoy special privileges at the Garden. As stated in its Constitution, it is also the purpose of the Society “To encourage the inhabitants of South Africa to take an active part in the progress and development of the National Botanic Gardens at Kirstenbosch, the Karoo Garden at Whitehill, and any other Garden that may be established by the Trustees of the said National Botanic Gardens; and to induce the said inhabitants to appreciate their responsibilities therein.” Also, “To augment the Government grants toward developing, improving, and maintaining fully equipped botanical gardens, laboratories, experimental gardens, etc., at Kirstenbosch and to make grants to the Trustees in aid of any Garden referred to in the preceding subsection.” The director is appointed jointly by the Trustees of the Gardens and the Council of the University of Cape Town. He is one of the professors of botany in the University. (*See Cape Town.*)

STELLENBOSCH

Cape Province

BOTANIC GARDENS OF THE UNIVERSITY

Head: G. C. Nel (1937).

WHITEHILL (Near Matjesfontein, Cape)

KAROO GARDEN

Established: 1921. The land was given to the Trustees of the National Botanic Gardens by the late J. D. Logan.*Area:* 20 morgen (=about 40 acres). About $\frac{1}{3}$ Natural Reserve, and protected from grazing and planting.*Director:* R. H. Compton (1921–). Karoo Garden is under the same control as Kirstenbosch, viz., National Botanic Gardens of South Africa. *Mail address:* Kirstenbosch, Newlands, C. P., South Africa.

Open free on week days during work hours. *Source of income:* Grant from the Botanical Society of South Africa; donations, sales. Does not receive Government funds. *Library:* Small reference. *Herbarium* now being established. *Plantations:* Cultivated area divided into sections on a geographical basis, e.g., Little Karoo, Southwest Africa, Hex River district, etc. Succulent flora chiefly dealt with, and planted according to districts. *See Kirstenbosch.*

Spain

BARCELONA

JARDÍ BOTÀNIC DE BARCELONA

Institut Botànic, Carrer de Sant Gervasi 94

Established: 1916, in the public gardens of the Parc de la Ciutadella; transferred in 1931 to Montjuic.*Area:* 8 hectares.*Director:* P. Font Quer (1916–).

Open every work day with the director's authorization. *Source of income:* Annual appropriations of the Government of the Generalitat de Catalunya, and from the city. *Library* (of the Institut Botànic de Barcelona): 2500 volumes, 500 pamphlets. *Herbarium* (of the Institut Botànic): 212,000 specimens of phanerogams; 14,000 cryptogams. *Plantations:* Geographic, systematic, medicinal plants. *Publication:* Index Seminum. *Living material supplied* to schools for study.

BLANES

JARDÍ BOTÀNIC "MAR I MURTRA"

Director: Carlos Faust.

MADRID

JARDIN BOTÁNICO DE MADRID

Plaza de Murillo 2

Established: 1755. *Area:* About 12 hectares.*Directors:* Antonio Joseph Cavanilles (1800–?); A. Frederico Gredilla y Gauns (1934); A. Garcia Varela (1936).*Herbarium:* About 70,000 specimens. *Publication:* Catalogus Seminum.

VALENCIA

JARDIN BOTÁNICO DE LA UNIVERSIDAD

Established: 1802. *Area:* 4 hectares.*Directors:*

1. Vicente Soriano (1802–1804)
2. Vicente Alfonso Lorente y Asensi (1804–1813)
3. José Paulí (1813–1817)
? (1817–1829)
4. Joaquin Carrascosa (1829–1843)
5. José Pizcueta Donday (1843–1863)
6. Rafael Cisternas Fontseré (1863–1876)
7. José Arevalo Baca (1876–1890)
8. Vicente Gonzalez Cavales (1891–1892)
9. Eduardo Boscá Casanoves (1893–?)
- ?. F. Beltrán (1936)

Open on all working days from sunrise to sunset. *Source of income:* Appropriations by the national government and by the University. *Library:* Small. *Herbarium:* About 10,000 specimens. *Plantations:* Systematic, geographic, local flora, economic. *Arboretum* (about 300 species). *Fruticetum* (about 190 species). *Publication:* Catalogus Seminum. *Museum:* Open, free, on working days, on presentation of permit from the director. *Living material*, including wild plants, is supplied to both public and private schools occasionally when requested.

Straits Settlements

PENANG

WATERFALL GARDENS

(Administered by Botanic Garden, Singapore, q.v.)

SINGAPORE

BOTANIC GARDENS

Established: 1859. *Area:* 72 acres.

Directors (first three called Superintendents):

1. Lawrence Niven (1859–1875)
2. Henry James Murton (1875–1880)
3. Nathaniel Cantley (1880–1887)
4. Henry Nicholas Ridley (1888–1912)
5. Isaac Henry Burkill (1912–1925)
6. R. E. Holttum (1925–)

Serves as a public park. Open free daily at all hours. *Source of income:* Annual appropriations by national government, and sale of plants and seeds. *Library:* Reference only. *Herbarium:* Large and representative collection of plants of the Malay Peninsula and neighbouring countries. *Publications:* Gardens' Bulletin, established 1913. Issued at irregular intervals. Offered in exchange. Seed List. *Plantations:* Systematic, ornamental, economic. *Arboretum:* About 3000 species of trees. (*See Penang.*)

Sumatra (Netherlands East Indies)

(NEAR) MEDAN (DELI)

SIBOLANGIT BOTANIC GARDEN

Established: 1914. *Area:* 18.3 hectares (plus 131 hectares).

Altitude: 300–525 meters above sea level.

Director (Curator): J. A. Lörzing (July, 1914–1927).

This Garden was planned in 1912 as a center for the study of Sumatran plant life—a branch establishment of the Buitenzorg Botanic Garden. A curator's residence was built in 1915 and in 1916 a rest house, office, and herbarium. "The surface was planted with shadow yielding trees, and in 1916 was added a surface of 131 hectares mainly covered by primary forest. The

curator made a large herbarium collection which was sent to Buitenzorg. Owing to economical depression the curator was pensioned off in 1925. The Private Deli Planters Society continued the garden and its curator up to 1927. In 1928 the Garden was again declared an official establishment of the Buitenzorg Botanic Garden and the Head Forester of the East-coast of Sumatra Residency was charged with the supervision. In 1932, however, owing to another economical depression, no funds could be made available by the Buitenzorg Botanic Garden. In 1934 the main part of the Garden, covering 119 hectares, was declared a nature preservation. In 1936 the old Garden was again cleared and labeled, so that this Garden, which can be reached by car in about 1½ hour from Belawan (harbour of Medan), is still alive though only on a small scale at present." (*See Java: Buitenzorg.*)

Sweden

BERGIELUND

See Stockholm (Hortus Bergianus)

GÖTEBORG

GÖTEBORGS BOTANISKA TRÄDGÅRD

Established: 1919 (1916). *Area:* 11 hectares under cultivation, 37 hectares wild park; very large reserves not yet fenced in. *Director:* Carl Skottsberg (July 1, 1919–).

Serves as a public park. Open free, daily, 8 a.m. until dark. *Source of income:* Appropriations by the City of Göteborg. *Library:* Several thousand volumes and pamphlets. No exact figures available. *Herbarium:* About 500,000 specimens. *Plantations:* Systematic, geographic, ecologic. *Arboretum and Fruticetum.* *Publications:* Acta Horti Gotoburgensis (Meddelanden från Göteborgs botaniska trädgård). Delectus Seminum. *Museum:* A small exhibition in connection with auditorium. Teachers bring classes of school children. *Living matter supplied* to local schools upon request. *Affiliation:* University of Göteborg.

HÄLSINGBORG

BOTANICAL GARDEN

Established: 1936. *Area:* 12 acres.

In process of establishment. Specially for the Flora of Skåne.

LUND

UNIVERSITETETS BOTANISKA TRÄDGÅRD

Ö. Vallgatan 18

Directors:

1. Frederick Wilhelm Christian Areschoug (1879–1898)
2. Sven Berggren (1898–1902)
3. Svante Samuel Murbeck (1902–1924)
4. Vacant (1924–1927)
5. Thore Christian Elias Fries (June 3, 1927–Dec. 31, 1930)
6. Artur Håkansson (1930–1933) (acting)
7. Nils Heribert-Nilsson (March 1, 1934–)

Publication: Index Seminum.

STOCKHOLM

HORTUS BOTANICUS BERGIANUS

Botaniska Trädgården, Stockholm 50

Established: 1791. *Area:* 17 acres.*Directors:*

1. Olof Swartz (1791–1818)
2. J. E. Wikström (1818–1856)
3. Nils Johan Andersson (1856–1879)
4. Veit Brecher Wittrock (1879–1914)
5. Klas Robert Elias Fries (1915)

Library: More than 6000 volumes. *Plantations:* Systematic; Rock Garden. *Herbarium:* More than 10,000 species in over 20,000 sheets. *Affiliation:* School of Horticulture. *Note:* Located at Freskati, in the north part of Stockholm. Called Bergielund garden by its founder, Peter Jonas Bergius (pron. Bäre-Yūs), who died in 1790, aged 60. He had been a pupil of Linnaeus and had built up the library and herbarium. Wittrock established the *Acti Horti Bergiani*, published by the Garden.

UPPSALA (1)

UPPSALA UNIVERSITETETS BOTANISKA TRÄDGÅRD

Botaniska Trädgården

Established: 1784. *Area:* 8.5 hectares.*Directors:*

1. Carl Pehr Thunberg (1784–1828)
2. Göran (Georg) Wahlenberg (1829–1851)

3. Elias Magnus Fries (1851–1863)
4. Johan Erhard Areschoug (1863–1876)
5. Theodor Magnus Fries (1877–1899)
6. Frans Reinhold Kjellman (1899–1907)
7. Hans Oscar Juel (1907–1928)
8. Nils Eberhard Svedelius (1928–)

Serves as a public park. Open free daily. *Source of income:* Annual appropriations by the National Government and "own funds." *Herbarium:* Vascular plants and ferns, 440,000 sheets; cryptogams, 820,000 covers. *Plantations:* Systematic, economic. *Arboretum.* *Museum:* Open free daily. *Publications:* *Symbolae Botanicae Upsalienses*; *Semina Selecta*.

UPPSALA (2)

LINNÉTRÄDGÅRDEN (HORTUS LINNAEANUS)

Linnégatan 6

Established: 1655; *re-established:* 1920. *Area:* 2 hectares.

Directors:

1. Olaus Johannis Rudbeck (1655–1691), Founder.
2. Olaus Olai Rudbeck (1691–1740)
3. Lars Roberg (1740–1742)
4. Carl Linnaeus (von Linné) (1742–1777). d. Jan. 10, 1778.
5. Carl von Linné, Jr. (1777–1783)
6. Carl Peter Thunberg (1784–1807)
- Discontinued (1807–1920)
7. Nils Eberhard Svedelius (1920–1930)
8. Carl G. Alm (1931–)

Open free daily, April–October, 9 a.m. to 9 p.m. *Museum:* Open daily, 1 p.m. to 3 p.m. Admission 0.50 Swed. crown. *Library:* "The Linnean Library"; 1200 volumes and pamphlets, only by Linnaeus or concerning him and his work. *Herbarium:* About 3000 specimens, "partly the old herbarium from the time of Linnaeus." *Plantations:* Systematic according to the system of Linnaeus; trees and shrubs native to Sweden. *Publication:* *Deductus Seminum*.

Owned and under the direction of the Svenska Linnésällskapet, a Society founded in 1917 to publish writings by and about Linnaeus and his pupils, and to restore and maintain the old Botanic Garden of the University as it was in the time of Linnaeus.

In 1807, under Thunberg, the new botanic garden of the University [see Uppsala (1)] was finished and all movable plants were removed from the Linnean garden. The latter was restored in 1920.

VISBY

BOTANIC GARDEN OF D. B. W.
(Sällskapet D. B. W.'s Trädgård)

Established: 1855. *Area:* 71 hectares.

Director: Erik Gustaf Granström (April 1, 1900–).

Serves as a public park. Open free daily, 8 a.m. to 10 p.m. *Source of income:* Contribution from D. B. W.'s Savings Bank. *No library or herbarium.* *Plantations:* Systematic, ecologic. *Arboretum.* *Fruticetum.* *Publication:* Sällskapet D. B. W. 1814–1914 (containing: Johansson, K. "D. B. W.'s trädgård." 1914), received after this publication was in page proof. *Living material* for study supplied occasionally to schools. "D. B. W." stands for "De Badande Vännerna" (The Bathing Friends).

Switzerland

BASEL

BOTANISCHER GARTEN

Botanische Anstalt der Universität, Schönbeinstrasse 6

Established: 1898. *Area:* 13,600 sq. m.

Directors: 1. G. Klebs (1898); 2. A. F. W. Schimper (1899–1901); 3. A. Fischer (1907–1912); 4. Gustav Senn (1912–?).

Serves as a public park. Open free daily. *Source of income:* From city and from the Freiwillige Akademische Gesellschaft, Basel. *Library:* Both reference and circulating. *Publications:* Samenverzeichnis. *Affiliation:* "The garden belongs to the botanical institute of the university."

BERN (1)

BOTANISCHER GARTEN DER UNIVERSITÄT

Altenbergrain 21

Established: 1859–60. *Area:* 2.5 hectares.

Directors: Ludwig Fischer (1860–1897); Edouard Fischer (1897–1933); W. H. Schopfer (1933–).

Serves as a public park. Open free daily, 8 to 12 a.m.; 2 to 6 p.m. *Source of income:* Appropriations from both the Canton and

the city of Bern. *Library and Herbarium.* *Plantations:* Chiefly systematic: Alpinum: Useful plants. *Publications:* Bericht über den botanischen Garten; Samenverzeichnis. *Living plant material* supplied in limited quantity to local schools for study. *Affiliation:* The Botanical Institute of the University of Bern.

BERN (2)

ALPENGARTEN SCHYNIGE PLATTE

Botanischer Garten Bern, zuhanden des Alpengartens

Schynige Platte

Established: 1927. *Area:* 0.83 hectare.

Administrative Management: Präsident des Alpengartens, H. Itten. For scientific and horticultural consultation: Die Direction des Botanischen Instituts und Gartens, Bern.

Serves as a public park. Open from the middle of June to October, 7 a.m. to 7 p.m. *Admission, 50 cents.* *Source of income:* "Subvention from the authorities and private persons." *Library:* Small, reference, for students. A small reference *Herbarium* has been started. *Plantations:* Geographic, ecologic, sociologic. *Publication:* The administrative Jahresbericht des Alpengartens Schynige Platte. *Lectures* are given in July and August for students, teachers, and others. *Affiliation:* The Botanic Garden of the University of Bern.

BEX

JARDIN BOTANIQUE (formerly "La Thomasia")

Institut de Botanique de l'Université de Lausanne

Established: 1894. *Area:* 10,000 square meters. *Altitude:* 1300 m.

Directors: 1. E. Wilczek (1894–1937); 2. F. Cosandey (1937–)

Open free daily, May 1 to September 30. *Source of income:* Appropriations by the Canton of Vaud. This is one of two gardens administered by the Institute of Botany of the University of Lausanne. *See Lausanne.*

BOURG-SAINT-PIERRE

JARDIN ET LABORATOIRE ALPINS DE LA LINNAEA

La Linnaea, Bourg-Saint-Pierre, Valais

Established: 1889. *Altitude:* 1700 meters.*Directors:*

1. Henri Correvon (1889–1915)
2. Robert Chodat (1915–1934)
3. Fernand Chodat (1934–)

Open to the public daily. Admission 0.25 centimes. *Source of income:* Société de l'Université de Genève. *Library:* 500 volumes. *Herbarium:* "Temporaire." *Plantations:* Geographic, ecologic, arboretum, fruticetum. 2000 alpine species. *Affiliation:* Administered by the University of Geneva.

Established by Henry Correvon, under the patronage of an international Committee. In 1915 the Société Académique de l'Université de Genève became owners of the Garden and appointed Dr. Robert Chodat director.

FRAUENFELD

BOTANISCHER GARTEN DER THURGAUISCHEN KANTONSSCHULE

Established: 1864. *Area:* 25 ares.*Directors* (always the professor of botany in the Kantonsschule) :

1. L. Wolffgang (1864–1872)
2. E. Kollbrunner (1872–1877)
3. G. Stricker (1877–1889)
4. Heinrich Wegelin (1890–1920)
5. August Günthart (1920–)

Source of income: Supported by the Canton of Thurgau as a part of the Kantonsschule. *Plantations:* Systematic, ecologic. *Instruction:* Lessons in botany in the Kantonsschule are given at the Garden.

GENEVA

CONSERVATOIRE ET JARDIN BOTANIQUES DE GENÈVE

Rue de Lausanne 192, Geneva

Established: 1817. *Area:* 6–7 ha.*Directors:*

1. Augustin-Pyrame de Candolle (1817–1835)
2. Alphonse de Candolle (1835–1849)

3. G. Reuter (1849–1872)
4. J. Brun (1874–1879)
5. Jean Muller (arg.) (1879–1896)
6. John Briquet (1896–1931)
7. B. P. G. Hochreutiner (1931–)

Serves as a public park. Open free, daily, from 7 a.m. to 7 p.m. The Alpine Garden is open on Thursday and Sunday. *Source of income:* Supported by the City and gift of Rockefeller Foundation. *Library:* 60,000 volumes. 40,000 pamphlets. *Herbarium:* 3,000,000 specimens. *Plantations:* Systematic, Alpine Garden, Geographic, Pharmaceutical Garden. *Arboretum* and a *Fruticetum*. *Publications:* Candollea; Boissiera; Annual Reports; Seed List. *Museum:* Open free, daily, from 2 p.m. to 5 p.m. except Saturday and Sunday. *Special lectures* given to the schools, to the public, and the University. *Supplies great quantities of living material* for study to the local schools. *Affiliation:* The actual Director is Professor of Systematic Botany at the University and Director of the institution called *Herbier Boissier* there.

Note: The origin of the Jardin Botanique of Geneva dates from the beginning of the 19th century, and is intimately associated with the arrival at Geneva of Augustin-Pyrame de Candolle. He had been professor of botany at Montpellier, and the establishment of a botanic garden was a tacit condition of his accepting the professorship at Geneva.

INTERLAKEN

ALPENGARTEN "SCHYNYGE PLATTE" (See Bern 2)

LAUSANNE

JARDIN BOTANIQUE DE L'UNIVERSITÉ DE LAUSANNE

Institut de Botanique de l'Université de Lausanne

Established: 1894. *Area:* 4000 square meters. *Altitude:* 500 m. *Directors:* 1. E. Wilczek (1894–1937); 2. F. Cosandey (1937–) and A. Maillefer (1937), co-directors.

Serves as a public park. Open free daily, 8 a.m. to 8 p.m. *Source of income:* Appropriations by the Canton of Vaud. *Library:* That of the Institut de Botanique, about 20,000 volumes and pamphlets. *Herbarium:* About 400,000 specimens. *Plantations:* Systematic, ecologic. *Arboretum* and *Fruticetum*. *Museum:* Open free daily. *Publication:* Graines Offertes en Echange.

Classes from schools frequently visit the Garden. *Note 1*: Plans have been adopted for moving the Garden to a larger site (about 20,000 square meters). *Note 2*: The Institut de Botanique also directs the Alpine Garden at Pont de Nant. (*See Bex (Vaud).*)

MONTREUX

JARDIN ALPIN "LA RAMBERTIA"

PONT DE NANT

JARDIN ALPIN (See Lausanne, p. 338, lines 3 and 4)

ST. CROIX

JARDIN BOTANIQUE "LA DRYADE"

ZÜRICH

BOTANISCHER GARTEN DER UNIVERSITÄT

Pelikanstrasse 30

Established: About 1834. *Area*: About 4 acres.

Directors:

1. Oswald Heer (1834–1882)
2. Carl Eduard Cramer (1882–1893)
3. Hans Schinz (July 18, 1893–April 15, 1929)
4. Albert Ulrich Däniker (ad interim, June 1, 1929–1933)
5. Albert Ulrich Däniker (1933–)

Open free daily. *Source of income*: Governmental credits. *Library*: More than 30,000 items. *Herbarium*: Approximately 1,125,000. *Plantations*: Systematic, morphologic, ecologic. *Publications*: Mitteilungen aus dem Botanischen Museum der Universität Zürich; Seed List (Verzeichnis im Tausch abgegebbarer Sämereien und Früchte). *Museum*: Open free daily. *Study material* supplied to local schools on request.

Tanganyika

DAR ES SALAAM

DAR-ES-SALAAM BOTANICAL GARDEN

Mr. E. H. Helps, Municipal Secretary, The Boma, Dar-es-Salaam, reports (July, 1938) that this so called "botanical garden," of 17 acres, is only "a pleasure ground."

Tasmania**HOBART****BOTANICAL GARDENS**

Established: 1844. *Area:* 25 acres.

Directors (Superintendents):

1. F. W. Neuman (1848–1857)
2. Francis Abbott (1857–1903)
3. Alexander Morton (1903–1908)
4. Robert Hall (1908–1911)
5. John Wardman (1911–?)

The garden is part of the Queens Domain of 640 acres, which is under the care of the Superintendent of Gardens. Open free to the public on week days from 7 a.m.–6 p.m.; on Sundays from 2 p.m.–6 p.m.

Source of income: Endowment, and the sale of plants and seeds. *Herbarium:* Composed chiefly of Tasmanian and Australian species, with a few European. *Lectures:* Public lectures on nature study and botany. *Study material* (flowers, leaves, buds, phanerogamic and cryptogamic plants) is supplied to schools occasionally when requested, but local schools do not depend on the garden for all their material.

LAUNCESTON**BOTANIC GARDENS**

(*Fide:* Director of Agriculture, Adelaide, Australia)

Tchécoslovaquie (See Czechoslovakia)

Tobago (See British West Indies)

Trinidad (See British West Indies)

Turkey**ISTANBUL****HORTUS BOTANICUS ISTANBULENSIS**

(ISTANBUL ÜNİVERSİTESİ NABATAT BAHÇESİ)

Biologi Enstitüsü, Müftülük

Established: 1936. *Area:* About 1.5 hectare.

Director: Alfred Heilbronn (1935–)

Open daily for students only. *Source of income*: Government. *Library and Herbarium*: Planned but not yet (1938) started. *Plantations*: Pharmaceutic, genetic. *Publication*: Index Seminum (Tohum Kataloğu).

Uganda

ENTEBBE

BOTANIC GARDENS

P. O. Box 2

Established: 1898. *Area*: 70–75 acres.

Directors:

1. Alexander Whyte (1898–1902)
2. Morley T. Dawe (1902–1903)
3. Ernest Brown (1903–1907)
4. Robert Fyffe (1907–Apr. 1, 1917)
5. S. Simpson (1917–June, 1929)
6. John Douglas Tothill (June, 1929– . . .)

During the last few years these beautiful gardens, situated on the shore of Lake Victoria, have been re-designed according to plans suggested by Sir Arthur Hill, K.C.M.G., and the fine collection of tropical plants, trees, and shrubs is now displayed under admirable conditions. *Source of income*: Protectorate Revenue. Supported by Agricultural Dept. funds annually. *Library*: About 300 volumes, 50–100 pamphlets available at the Agricultural Laboratories, Kampala (Bot. Section). *Herbarium*: 4000 specimens approximately. No *Arboretum*, but many fine tree specimens are among the collections. There is a small collection of fruit trees (tropical). *Supplies living material* for study to local schools.

Union of Socialist Soviet Republics ¹

ALMA ATA (KAZAKHSTAN)

HORTUS BOTANICUS ALMAATENSIS ACADEMIAE SCIENTIARUM

Académie des Sciences, Alma-Ata, Ul. Vinogradova 18

Director: A. J. Milorzorov (1937). R. A. Ermasov (1937).

Note: Located at Lat. 43° 13' N., Long. 76° 55' E.; altitude 900 meters. *Publication*: Index Seminum.

¹ The transliteration of Russian words, including the official names of Russian Gardens, follows faithfully the forms used by our Russian correspondents. Very frequently the form used in the text of a letter would be different from that on the printed letter-head of the same letter. Any attempt at uniformity here seemed impractical and relatively unimportant.

ASKANIA NORA (UKRAINA)

BOTANIC GARDEN

Affiliation: Die All-Ukrainische Akademie der Landwirtschaftlichen Wissenschaften, Staats-Steppen Institut. Seed List.

ASHKHABAD (TURKMENISTAN)

HORTUS BOTANICUS TURCOMANICUS

Director: L. Kuleschov (1937). *Affiliation:* Turkmenski Botanitscheskij Institut. *Publication:* Delectus Seminum.

BAKU (1)

HORTUS BOTANICUS BAKUENSIS

Rue Communiste 10, Baku (Baki), A. S. S. R.

Established: 1935. *Director:* A. A. Grossheim (1935–).

Affiliation: Sectio Botanica Filiae Azerbaidzhanicae Academiae Scientiarum, U. S. S. R. *Publication:* Delectus Seminum.

BAKU (2)

BOTANIC (EXPERIMENTAL) GARDEN (OPYTNIJ
BOTANITSCHESKIJ SAD)

BATUM (ADSHARISTAN)

SUBTROPICAL BOTANICAL GARDEN

(BATUMSKIJ BOTANITSCHESKIJ SAD)

Makhinjauri, Georgia, U. S. S. R.

BILA ZERKVA (UKRAINA)

BOTANIC GARDEN (BOTANITSCHESKIJ SAD)

Publication: Delectus Seminum.

CHARKOW (UKRAINA)

BOTANIC GARDEN (CHARKOWSKIJ BOTANITSCHESKIJ SAD)

Klotschkowskaja 52

DNEPROPETROVSK

BOTANIC GARDEN (BOTANITSCHESKIJ SAD)

Rue Urizki 10, Dnepropetrovsk, Ukraina

Director: A. Levitska (1937).*Publication:* Seed List.

ERIVAN

BOTANIC GARDEN (BOTANITSCHESKIJ SAD ARMENII)

Daschli—Kutscha 49, Armenia, U. S. S. R.

GORKY (FORMERLY NISHNY NOVGOROD)

THE GOROKOVSKY BOTANICAL GARDEN OF THE STATE UNIVERSITY

Established: April 1, 1935. *Area:* 250 ga. (600 acres).*Director:* S. S. Stankov (April 1, 1935—).

Open to the public, June 1–October 1, 10 a.m. to 8 p.m. *Source of income:* Government subsidy and sale of plants and seeds. *Library:* 4500 volumes. *Herbarium:* About 100,000 specimens; about 4000 types. *Plantations:* Systematic, dendrological, useful plants (pharmaceutical, technical, edible, fodder), decorative. *Publications:* Sketch project Bot. Garden Gork. University; *Delectus Seminum* (since 1936). *Special lectures* are given to school children; *study collections* loaned to schools.

GORY-GORKI

BOTANICAL GARDEN OF THE WHITE RUSSIAN AGRICULTURAL
INSTITUTE

Gory-Gorki, Belorussia

Established: 1922. *Area:* Herbage plants, 3 hectares; Field plot, 1.5 ha.; Dendrological Garden, 8 ha.*Directors:*

1. Joseph G. Wasilkov (Wassilkoff) (1922–1931)
2. T. N. Godnev (1932–1933)
3. N. F. Nikolaev (Nikolajev) (1934—)

Open free daily, 9 a.m. to 5 p.m., except “rest days.” *Source of income:* Selling of seed and planting material, and appropriations in the State budget. *Library* (of the Agricultural Institute): about 200,000 volumes. *Herbarium:* More than 3000 speci-

mens. *Plantations*: Systematic, fodder crops, fibrous, and ornamental plants. *Publications*: Delectus Seminum; in The Annals of the White Russian Agricultural Institute. *Lectures and excursions* for school children are organized in summer.

JALTA (CRIMEA)

MOLOTOV NIKITA BOTANIC GARDEN

(GOS. NIKITAKIJ OPYTNIJ BOTANITSCHESKIJ SAD, IMENI MOLOTOWA)

Director: V. D. Abajev (1937). *Publication*: Seed List.

KAMIANETZ-PODILSKYJ

BOTANIC GARDEN (BOTANITSCHESKIJ SAD)

P. O. Box 77, Kamianetz-Podilskyj, Ukraina

Established: 1930. *Directors*: N. A. Shukowskyj (1937); M. M. Krutzkewicz (1938). *Publication*: Index Seminum.

KASAN

BOTANIC GARDEN OF THE UNIVERSITY

(BOTANITSCHESKIJ SAD UNIVERSITETA)

KIEV (KIEFF, KIEW) (1)

BOTANIC GARDEN OF THE BOTANICAL INSTITUTE OF THE
UCRAINIAN ACADEMY OF SCIENCES

Rue Vydubetzkaja No. 49, Kiev (Ukraina)

Established: 1838. *Area*: "22.5 hectares plus 207 hectares."

Directors:

1. Johannes Th. (Ivan Theodorovich) Schmalhausen (1879–1894)
2. Sergius Gavrilovitch Nawaschin (1895–1914)
3. Alexander Vassilyevich Fomin (1914–1935)
4. N. Ptitzyn (1936–)

Serves as a public park. Open daily to the public. *Source of income*: Appropriations from the Soviet Ukrainian Government. *Arboretum and Fruticetum*: 1500 species. *Species under glass*: 6000. *Publications*: Seed List ("Index Seminum"). "Journal de l'Institut Botanique de l'Académie des Sciences." *Living material* for study is supplied for the Kiev University and Institutes. *Herbaria*: Herbarium Generale, Herb. Ucrainicum, Herb. Caucasicum. *Museum*: Specimens mounted for public inspection.

KIEV (2)

MUNICIPAL BOTANIC GARDENS

(HORTUS BOTANICUS FOMINIANUS KIOVIENSIS)

Ul. Kominterna 1, Kiev (Ukraine)

Director: N. W. Dubowik (1936).

KIROVSK (FORMERLY CHIBINOGORSK)

HORTUS BOTANICUS ARCTO-ALPINUS STATIONIS KOLAËNSIS

NOMINE KIROVI AKADEMIAE SCIENTIARUM

(BOTANITSCHESKIJ SAD AKADEMII NAUK)

Hortus Botanicus, Kirovsk, Peninsula Kola

Established: 1932. *Area:* 1200 ha. *Director:* N. Avrorin (1938).

Note: This Garden was established by the Academy of Sciences, U. S. S. R., on the initiative of the Kola Expedition, by Academician A. E. Fersman and the Soviet Party, and economic organizations of the Murmansk District. It is located in the Chibinsk Mountains, Kola Peninsula (Murmansk District, Leningrad Region), north of the Arctic Circle ($67^{\circ} 35'$ north latitude), near the new town of Kirovsk (formerly Chibinogorsk) and the apatite mines. It is on a moraine on the slope of Mt. Woodyavrchorr (Vud'iavrchorr). Its altitude ranges from 315 to 1060 meters above mean sea level. It is reported to be the first botanical garden beyond the Arctic Circle. *Herbarium:* 10,000 specimens. *Plantations:* Systematic, geographic, ecologic. *Arboretum.* *Living material* and special lectures for schools. *Publication:* Delectus Seminum.

KUJBYSHEV (KOOIBUSHEFF)

BOTANICAL GARDEN

Ovrag Podpoljschikov, Kujbyshev-19

Established: January 1, 1932. *Area:* 64 hectares.*Directors:* 1. V. J. Smirnov (1932–1933); 2. V. M. Kartashov (1934–1936); 3. M. N. Jashanov (1937–).

Open daily, 10 a.m. to 5 p.m. *Admission:* 10–50 copecks. *Source of income:* Budget of the State. *Library:* About 1500 volumes and pamphlets. *Herbarium:* About 2000 specimens. *Plantations:* Systematic, “geographic (alpinetum or rockeries),”

economic (food, rubber, textile plants, etc.), morphologic-ecologic (for schools). *Arboretum* and *Fruticetum* being established (1938). *Publication*: Seed List. *Special department* for botanical education for school children; *collections and living material* for study supplied to local schools. *Affiliation*: Board of Instruction of the Kooibucsheff Region.

KUJASHIZA (BELORUSSIA)
BOTANIC GARDEN (BOTANITSCHESKIJ SAD)

LENINGRAD (1)

INSTITUTE AND BOTANIC GARDEN OF THE ACADEMY OF SCIENCES
OF THE U. S. S. R.

(BOTANIČESKI INSTITUT I SAD VSESOUYUSNOI AKADEMII
NAUK)

Pessochnaya 2, Leningrad, 22

Established: 1st, about 1713 by Peter the Great as a Druggist's Garden. 2nd, 1824, reorganized as the Imperial Botanic Garden. 3rd, 1917, again reorganized as the Main Botanic Garden of the U. S. S. R. In 1930 the Garden was amalgamated with the Botanical Museum of the Academy of Sciences and received its present name. *Area*: 16 hectares.

Directors:

1. Friedrich Ernst Ludwig von Fischer (1843–1850)
2. Karl Anton Meyer (1850–1855)
3. K. K. Küster (1855–1857)
4. Eduard August von Regel (1857–1865)
5. Ernst Rudolph von Trautvetter (1865–1875)
6. Eduard August von Regel (1875–1892)
7. Alexander Batalin (1892–1896)
8. Alexander Fischer de (von) Waldheim (1896–1917)
9. Boris Lawrentjewitsch Issačenko (Issatschenko) (1917–1930)
10. D. V. Vassiliev (1930–1931)
11. Boris Aleksandrovič Keller (1931–1937)
12. Boris K. Schischkin (1937–)

Serves as a public park. Open daily, May 1–October 1, 10 a.m.–dusk. Admission to grounds, 25 kop. *Conservatories*: Open every day in the year, 11 a.m.–4 p.m. Admission, 75 kop. Vis-

itors forming groups of 20 persons pay 50 kop. each. Extra charge for guide, 9 roubles. *Source of income*: Annual appropriation by Government. *Library*: About 100,000 volumes and pamphlets. "The leading periodicals received." *Herbarium*: Approximately 5,000,000 specimens. *Plantations*: "The whole garden represents an *Arboretum and Fruticetum*, laid out partly in a landscape and partly in a formal style. The plantations are arranged geographo-systematically and economically. Special division of medicinal plants."

Publications: *Sovietskaia Botanika* (bi-monthly, established 1933). *Acta Instituti Botanici Academiae Scientiarum U. R. S. S.*; Four Series as follows: I. *Flora et systematica, plantae vasculares* (est. 1933); II. *Plantae cryptogamae* (est. 1933); III. *Geobotanica* (est. 1934); IV. *Botanica experimentalis* (est. 1934). *Notulae systematicae ex Herbario* (1920-26); *Notulae systematicae ex instituto cryptogamico* (1920-26); *Delectus seminum*; *Flora U. R. S. S.* (8 volumes have appeared).

"*School children* (up to 80,000 a year) visiting the plant houses in groups are given scientifically trained guides who give talks on plant biology, ecology, plant geography, and economic plants. A group of "Young Naturalists" are receiving instruction in botany." *Study collections* supplied to schools occasionally; living material rarely. *Affiliation*: The Garden is not affiliated with any university or college.

"For one hundred years the Garden made little progress, but, during the reign of Alexander the First, F. E. L. Fischer, formerly in charge of the gardens of Count Al. Rasumoffsky, at Gorenki, near Moskow, became director. Under Fischer the Garden became a first-class botanical institution." (Cohn, Ferdinand. *Ueber den botanischen garten in St. Petersburg. Botanische Zeitung.* 18: 138. 1860.)

LENINGRAD (2)

DENDROLOGICAL GARDEN

Forest-Technical Academy, Leningrad 18. Seed List.

MINSK (BELORUSSIA)

BOTANIC GARDEN OF THE ACADEMY OF SCIENCES OF WHITE RUSSIA

Established: 1930. *Area*: 98 hectares.

Director: S. P. Mjelnik (1936). *Delectus Seminum*.

Note: A portion of the Garden is a nature reserve.

MOSCOW (1)

BOTANICAL GARDEN OF THE UNIVERSITY OF MOSCOW

(BOTANITSCHESKIJ SAD)

1 Meshchanskaja, 28, Moscow 10

Established: 1707. *Area:* 6 hectares.*Directors:*

1. Hoffmann (1804–1824)
2. Maximowicz (1824–1834)
3. Fisher von Waldheim (1834–1860)
4. N. J. Kaufmann (1860–1870)
5. Chistakof (1870–1873)
6. Goroshakyn (1873–1900)
7. Golenkyn (1900–1931)
8. K. Meyer and J. Rudakow (1932–1933)
9. Serge Gabrilovich Navashin (1934–1937)
10. D. A. Synytskaja (Sinizyna?) (1937–)

Serves as a public park. Orangery open daily, 9:30–5; “The Park” on even days, 9:30–7. Admission: Excursionists, 20 cop.; individuals, adults, 60 cop., children, 20 cop. *Source of income:* Government subsidy, admission fees, and sale of plants. *Library:* About 10,000 volumes. *Herbarium:* In the University. No separate herbarium for the Botanic Garden. *Plantations:* In “Dendropark,” systematic; Orangery, geographic. *Arboretum* and a *Fruticetum*. *Publications:* Delectus Seminum; Guide. *Lectures* are given at the Garden to school children, and *study material* is supplied to schools.

MOSCOW (2)

BOTANIC GARDEN OF THE COLLEGE OF AGRICULTURE

See Moscow (3)

MOSCOW (3)

BOTANIC GARDEN OF THE TIMIRIASEV ACADEMY OF AGRICULTURE

Timiriasev Academy, Corpus 17, Cathedra Botanica, Moscow 8,

Director: P. M. Zhukovsky (1936). Delectus Seminum.

NIKITA

GOVERNMENT BOTANICAL GARDEN

See Jalta, p. 343

ODESSA

GOVERNMENTAL BOTANIC GARDEN (GOSUD. BOTANITSCHESKYI
SAD)

(HORTUS BOTANICUS UNIVERSITATIS RESPUBLICANAE
ODESSANAE)

Proletarskyi Bulwar 87, Odessa, Ukraina

Directors: W. I. Lipskii (?–1937); I. A. Vlassenko (1937–).
Seed List.

OMSK

BOTANIC GARDEN OF THE KIROV INSTITUTE OF AGRICULTURE
(OMSK BOTANITSCHESKIJ SAD. OMSKOGO SEL'SKO-KHOZIAIST-
VENNOGO INSTITUTA IMENI S. M. KIROVA)

Omsk (Siberia), U. S. S. R.

Established: 1927. *Area:* 6 hectares.

Directors: 1. J. J. Petrov (1927–1932); 2. N. A. Plotnikov
(1932–).

Open free daily except holidays. *Source of income:* Govern-
ment. *Library:* That of the Institute. *Herbarium:* About 5000
specimens. *Plantations:* Economic. *Publications:* Index Semi-
num (1935–1937); "A pamphlet." *Special lectures* to school
children. *Loan collections and living material for study* supplied
to local schools.

PENZA

BOTANIC GARDEN (BOTANITSCHESKIJ SAD)

Krasnaja 36, Penza

Director: D. G. Nazarov (1937). Delectus Seminum, quae cu-
ratio arearum reservatarum rei publicae in regione Kujby-
schevensi (Volga media) pro mutua commutatione offert.

PERM

JARDIN BOTANIQUE "A. HENCKEL "

L'Université d'État, Perm II, Zaimka

Director: E. A. Pavsky (1937). Index Sporarum et Seminum.

RIDDER (ALTAI)

BOTANIC GARDEN (BOTANITSCHESKIJ SAD)

ROSTOV-NA-DON

BOTANIC GARDEN (BOTANITSCHESKIJ SAD)

Rostov-na-Don, P. O. Box 330

Director: M. Wipirailenko (1937). Seed List.

SHITOMIR (UKRAINA)

BOTANIC GARDEN OF THE AGRICULTURAL INSTITUT

Director: J. Litwinov (1936); E. I. Gorenky (1937). Index
Sporarum, Seminum, Fructuum.

SOTSCHI

ARBORETUM AND FOREST EXPERIMENT STATION

Chudjakov Park, Sew. Kavk. Kraj (Northern Caucasus)

SVERDLOVSK (EKATERINBURG)

BOTANIC GARDEN (BOTANITSCHESKIJ SAD)

4 Mel'kowska, no. 1, a, Ural

Director: Prof. Kasanski (?-1936). Index Seminum.

TASHKENT

HORTUS BOTANICUS UNIVERSITATIS ASIAE MEDIAE

Director: W. Isaieff (1930); Th. Russanov (1936). Index
Seminum.

TIFLIS (TBILISI) (1)

STATE BOTANICAL GARDEN (BOTANITSCHESKIJ SAD)

Tiflis, Georgia, U. S. S. R. (Caucasus)

Director: Adolph Rolloff (?).

TIFLIS (2)

BOTANIC GARDEN OF THE ACADEMY OF SCIENCES

(BOTANITSCHESKIJ SAD AKADEMII NAUK)

Directors: N. Gogeschwili (1933); N. Busch (1934); D. Sos-
novsky (1937). *Publication:* Delectus Seminum.

TOMSK

BOTANIC GARDEN OF THE TOMSK STATE UNIVERSITY
(NAMED AFTER V. V. KUYBYSHEV)

Timiriazev's Prospect, No. 3, Tomsk, Novosibirsk Region

Established: 1885. *Area:* 115 hectares.

Directors:

1. P. N. Krylov ("during 37 years").
2. V. V. Sapozhnikov ("during 10 years").
3. G. V. Puchinkin ("for some time past and at present").

The tree nursery serves as a public park. Open free daily, 9 a.m. to 10 p.m. *Source of income:* From sale of by-products of research processes; sale of conservatory plants. The fixed budget consists of State appropriations. *Library:* Combined with that of the University. *Herbarium* (of the University and of the Garden): More than 250,000 specimens. *Plantations:* Ecologic. *Arboretum. Fruticetum. Publications:* "The Transactions of the Botanic Garden were published as 'Records' (Vols. 1-84), and as 'Transactions' of the Tomsk State University (Vols. 85-89)." *Special lectures* are given to members of the circle "Young Investigators, according to Mitchurin's method." *Loan collections and living material* supplied to schools.

UFA

HORTUS BOTANICUS (BOTANITSCHESKIJ SAD)

VLADIVOSTOCK (DALNIJ WOSTOK)

BOTANIC GARDEN OF THE B. I. N.

(OTDELENIE GLAWNOGO BOTANITSCHESKOGO SADA)

VOLOGDA

BOTANIC GARDEN (BOTANITSCHESKIJ SAD)

VORONESCH

BOTANIC GARDEN (BOTANITSCHESKIJ SAD)

Universitetskaja ul. 5

Established: 1918. *Area:* 4 hectares.

Directors: 1. B. A. Keller (1918-1931); 2. W. Ph. Vassiliev (1931-)

Open free daily. *Source of income*: State appropriations. *No Library or Herbarium*. *Plantations*: Economic, ecologic. *Arboretum*. *Fruticetum*. *Publication*: Transactions of the Experimental Botanical Station. *Delectus Seminum*. *Note*: The returned questionnaire gives the official name as, "Experimental Botanical Station named after B. A. Keller." *Affiliation*: The Voronesch Agricultural Institute.

WASILJEWO

ARBORETUM OF THE KASAN AGRICULTURAL INSTITUTE
(DENDROL. SAD INST. SELSKOGO CHOSJAISTWA I LESOWODSTWA)
Address: Wasiljewo, Mosk.-Kasansk Shel. Dor. (i.e., on the
Moscow-Kasan Railroad)

WITEBSK (BELORUSSIA)

BOTANIC GARDEN OF THE VETERINARY COLLEGE
(BOTANITSCHESKIJ SAD VETERINARIYA INSTITUT)
Woropajewskaja ul.

UNITED STATES OF AMERICA

Arizona

SUPERIOR

BOYCE THOMPSON SOUTHWESTERN ARBORETUM, INC.
Established: 1924; First planting, 1924; Officially opened April
6, 1929. *Area*: 401 acres.
Directors: Franklin Jacob Crider (1924-1933); Frederick Gibson
(Jan. 1, 1934-).

Note: The purpose of this Arboretum, as stated in its pamphlet, "Purpose, History, Dedication" (Superior, Arizona, July, 1930) is as follows: ". . . the specific purpose of the institution, as now conceived, is to bring together and grow, for study and possible utilization, the plants of sub-arid climates and to publish the results of such investigations." There is a special collection of Cacti. Col. Thompson said: "I have in mind more than mere botanical propagation. I hope to benefit the State and the Southwest by the addition of new products . . . to see if we cannot make these mesas, hillsides, and canyons far more productive and

of more benefit to mankind. . . . We will build here the most beautiful, and at the same time the most useful, garden of its kind in the world."

Source of Income: Income from endowment provided by the founder, Col. William Boyce Thompson. Through Special Usage Permit from the U. S. Federal Forest Service, the total area available for Arboretum purposes has been increased to 1,760 acres. The mean rainfall is 17 inches, about equally divided between mid-summer and winter.

Through cooperation with the Forest Service, a nursery is maintained for the growth of plants for erosion control, revegetation and ornamentation, for use on public lands. Guest house for visiting scientists; the Thompson residence is available to donors.

California

ANAHEIM

RANCHO SANTA ANA BOTANIC GARDEN

P. O. Box 327, R. F. D. 3, Anaheim

Executive Office: 1280 Shenandoah Road, San Marino.

Established: 1927. *Area:* 200 acres.

Director and Founder: Mrs. Susanna Bixby Bryant.

Open Fridays, April, May, and June, 10 a.m. to 4 p.m. *Source of income:* Private endowment. *Library:* About 2000 volumes. *Herbarium:* 21,000 mounted specimens of plants indigenous to California. *Plantations:* Systematic, ecologic. Restricted to California flora. *Museum:* Admission only by permit to be obtained by written request to the administration building. *Publications:* Descriptive pamphlet (1933); Occasional papers. Monographs: Horticultural Series; Botanical Series are "just beginning" (1938). Report (Privately printed), April 1, 1931.

The announced primary purpose is to provide facilities for research in plant life by assembling in one accessible locality a living collection of the different species of plants indigenous to California that will grow in the Santa Ana Cañon, Orange County, 40 miles East of Los Angeles. Educational work is planned in cooperation with schools and colleges in their nature study and botany classes by means of field days at the Ranch.

"The Garden Foundation was legally established in 1934 under which the properties and endowment were placed in the hands of a

self-perpetuating board of five trustees." The plantings are reported (as of 1938) "to represent over one-half of the kinds of trees and shrubs of the state," in addition to the herbaceous plants.

BERKELEY (1)

BOTANIC GARDEN OF THE UNIVERSITY OF CALIFORNIA

Established: 1891. *Area:* 5 acres. Discontinued.

Directors: Edward Lee Greene (1891–1895); William Albert Setchell (1895–?).

BERKELEY (2)

UNIVERSITY OF CALIFORNIA BOTANICAL GARDEN

Established: July 1, 1934. *Area:* 60 acres. The first Garden was established in 1891.

Director: Thomas Harper Goodspeed (Dec. 1, 1934–).

Open free to the public daily, 9 a.m.–5 p.m. Source of Income: Budget of University of California and private benefactions. Library and Herbarium not distinct from those of the University. *Plantations:* Systematic and morphologic. Himalayan Area. An *Arboretum* and *Fruticetum* under development as of 1936. *Publications:* "Leaflet" series: taxonomic, morphologic, and cultural notes on Garden collections.

LOS ANGELES (1)

CALIFORNIA BOTANIC GARDEN (ABANDONED)

(Formerly) 600 Mandeville Canyon Road, Los Angeles

Established: 1927. *Area:* 800 acres.

Director: Elmer Drew Merrill (1927–1929).

Note: Owing to the economic depression this Garden was abandoned in 1930. The area has been built up as a residential section. "The only thing that ever came out of our ideal was the herbarium Dr. Merrill purchased and which was subsequently presented to the University of California at Los Angeles."

Publications: Members Bulletin, June, 1928–May, 1929; Booklet of Information (no date; about 1929); Descriptive and Historical Material, 1928.

SAN FRANCISCO

GOLDEN GATE PARK

There is a collection of plants in Golden Gate Park, and this is sometimes referred to as a "botanic garden." A letter from Miss Alice Eastwood, Curator, Department of Botany, California Academy of Sciences, states as follows: "There are more than 3000 species of plants from all over the world in Golden Gate Park. However, as none are labelled, Golden Gate Park cannot be considered to be a real botanic garden. . . . A fund has been left for a botanic garden but so far nothing has been done."

SAN MARINO

HUNTINGTON BOTANICAL GARDEN

Established: 1928. *Area:* 200 acres.

Superintendent, then *Director (Curator)*: William Hertrich (1928-).

Open free, daily (except Mondays), from 1:15 until 4:30 p.m. *Source of income:* Trust Endowment. *Library:* Approximately 3000 volumes and pamphlets. *Plantations:* "Evenly divided into desert plants and subtropical trees, shrubs, cycads, etc." Desert plants, about 15 acres; Ornamentals, about 50 acres; Economic, fruit trees, 25 acres; "Other features such as the Palm Collection, Japanese Garden, Rose Garden, etc., 15 acres, leaving about 100 acres for future expansion." *Arboretum.* *Publication:* "The Genus *Cereus*," by Dr. E. Werdermann. Supplies surplus living matter to schools.

"The Garden had its beginning as a private Estate owned and established by the late Henry E. Huntington in 1905. It gradually developed into an experimental garden with the purpose of introducing for trial subtropical ornamental and economic plants. In 1919 it was definitely established as part of a deed of trust in conjunction with other deeds such as the Founder's Library and the Art Gallery—all of which are administered by the same Board of five Trustees."

SANTA BARBARA
BLAKSLEY BOTANIC GARDEN

Affiliated with the
Santa Barbara Museum of Natural History

Established: 1926. *Area:* 30 acres. A memorial to Henry Blaksley, father of the late Anna Dorinda Blaksley Bliss, who purchased the land and created the initial endowment fund. Located on Mission Canyon Road.

Directors:

1. Elmer J. Bissell (1926–1936)
2. Maunsell Van Rensselaer (1936–)

Purposes: 1. To study the culture of native Californian plants of ornamental value. 2. To demonstrate the adaptability of these plants to cultivation by exhibiting them in systematized groupings in a landscaped setting. 3. To cooperate with schools, colleges, and the general public in furthering a knowledge of the flora of California.

Source of income: Interest from endowment, special contributions. *Serves as a public park.* Open free daily from 8 a.m. to 5 p.m. *Library:* Approximately 500 volumes and pamphlets dealing with the Californian flora. *Herbarium:* Maintained by the Santa Barbara Museum of Natural History. *Plantations:* Systematic, ecologic, and geographic. *Plant material supplied* to the schools of Santa Barbara and to the Santa Barbara State College.

SANTA MONICA
BOTANICAL GARDEN OF UNIVERSITY OF CALIFORNIA AT
LOS ANGELES

405 Hilgard Ave., Los Angeles

Established: 1933. *Area:* About 25 acres.

Director: Arthur Monrad Johnson (1937–). No previous official director.

Open free daily at all hours. *Source of income:* "None. For labor to date we have been dependent upon WPA (Federal Works Progress Administration) and NYA (National Youth Administration)." *Plantations:* Not yet classified. Planted to date (May, 1938), about 1400 species, mostly trees and shrubs, in over 500 genera and about 150 families, representing all continents, New Zealand, and islands of the Pacific. Special groups: Cacti, aloes, South African Euphorbias.

Connecticut

HARTFORD

HARTFORD ARBORETUM

Area: 260 acres in Batterson Park, West Hartford.

Park Superintendent: George H. Hollister.

During 1935 a botanical survey was made, with Federal Works Progress Administration (WPA) labor, to determine what trees, shrubs, and herbaceous plants were on the site. The appropriation was \$470. In 1936 preliminary plans were being made by a landscape architect. During the winter of 1937-38 work was started with WPA labor, "clearing the Great Meadow and some excavation was made for the pond. . . . At present (April 22, 1938) the work is at a standstill."

A "Memorandum Report," by Olmsted Brothers (*Parks and Recreation*: 21: 353. April, 1938.), states that "The scheme is based upon the conception—outlined by the superintendent . . . —of a landscape arboretum rather than a purely scientific institution; that is, an arboretum that will give first consideration to indigenous plants, and will display these plants in beautiful natural settings and in their natural associations with other plants." It is the intention "to subordinate or adjust the strictly scientific functions to the broader and more popular functions of showing the values of plants as elements of landscape and emphasizing particularly certain typical associations of plants that . . . might occur naturally in any particular environment."

NEW HAVEN

MARSH BOTANICAL GARDEN

Established: 1900. *Area:* 17 acres.

Directors:

1. James William Toumey (1900-1919)
2. Committee (Henry S. Graves, Chairman) (1920-1926)
3. George Elwood Nichols (1927-)

Serves within limits as a public park. Admission free, daily. *Source of income:* Yale University, general funds. *Library:* Departmental library of the University Department of Botany. *Herbarium:* Herbarium of the Department of Botany, including local

Connecticut collection of about 30,000 sheets. *Arboretum*: None has been definitely organized, but several plantings of trees and shrubs on University grounds are planned along arboretum-fruticetum lines, while the Yale Nature Preserve (150 acres) contains an excellent representation of native species. *Plantations*: Systematic, native plants; educational tulip garden, iris garden, rock garden, and other displays. *Publication*: Annual Seed Exchange List. *Affiliation*: With Yale University.

NEW LONDON

CONNECTICUT ARBORETUM AT CONNECTICUT COLLEGE

Established: 1931. *Area*: 90 acres.

Director: George Sherman Avery, Jr. (1931—).

Serves within limits as a public park and is open at all times, free of charge. *Source of income*: Appropriations by Connecticut College and gifts of friends. *Herbarium*: 6000 specimens. *Plantations*: Systematic. *Publication*: Bulletin, published once yearly, starting 1934.

STORRS

THE AGRICULTURAL BOTANIC GARDEN OF THE CONNECTICUT AGRICULTURAL COLLEGE (Discontinued)

Established: 1909. *Area*: 1 acre.

Director: Albert Francis Blakeslee (1909–1915).

Source of income: Annual appropriations by the college.

Plantations: Systematic, economic, ecologic, arboretum (100 species), local flora.

Note: This Garden was founded primarily as an outdoor museum and laboratory for the Department of Botany of the college. It supplied study material to the regular college classes and the summer school. The entire college campus was laid out by a landscape architect, and a planting plan adopted with reference to future walks, drives, and buildings, and with the aim of developing the campus as a scientific arboretum.

We are informed (1936) that after 1915 this Garden underwent a gradual decline and was abandoned in 1928, when it was assigned to the Department of Floriculture of the College and used for a display of herbaceous ornamentals.

District of Columbia

WASHINGTON (1)

UNITED STATES BOTANIC GARDEN

Established: May 8, 1820. *Area:* 5 acres. Increased, 1824, to 12.5 acres. The Botanic Garden property also includes 22.58 acres known as Poplar Point Nursery, adjacent to Anacostia Park, added in 1926.

After about 20 years the Garden was discontinued and the property, which had been assigned to the Columbian Institute for botanic garden purposes, reverted to the Federal Government. Thomas Jefferson, John Adams, James Madison, and Lafayette were members of the Institute and active in promoting the Botanic Garden.

Re-established: May 15, 1850, by Act of Congress, on the present site on the Mall. The name "Botanic Garden" was not officially applied to the site until August 18, 1856, when the Joint Committee on the Library was charged by Congress with its administration. ". . . all annual maintenance appropriations, particularly those providing for the employment of the necessary personnel of the gardens, have always been authorized to be expended under the direction of this committee. . . ."

(*Superintendents*): *Directors* (Title changed, 1920):

1. William D. Brackenridge (Horticulturist) (1842–1852)
2. William R. Smith, Gardener (1853–1863 or 64); Supt. (1863 or 64–1912)
3. Charles Leslie Reynolds (July 15, 1912–1913)
4. George W. Hess (December 22, 1913–June 30, 1934)
5. David Lynn (architect of the Capitol), acting (July 3, 1934–)

Note: According to a preliminary Report on the United States Botanic Garden by the House (of Representatives) Committee on the Library (73rd Congress, 2nd Session. House Committee Print. Congressman Kent E. Keller, Chairman; John G. Bradley, Clerk, Washington, 1934), the activities of the Garden in recent years "have consisted mainly in the purchase, care, and distribution of growing plants. . . . Comparatively speaking, propagation, experimentation, and kindred activities have been limited. Another activity of the Garden . . . is the giving away of

growing plants and cut flowers to members of Congress and friends. . . ." This was discontinued by Act of Congress approved June 30, 1932.

The same Report states that the cost of this Garden has varied from \$5000–\$6000 a year (during the first years) to a maximum of \$173,960 in 1930, with a total of \$3,511,180 for the entire period 1842–1934, an average for the 92 years of less than \$40,000 a year. This does not include the cost of building and grounds of the new conservatory in 1927, \$1,862,538, which would bring the average to about \$58,500 per year. The new conservatory was completed January 13, 1933, at a cost of \$633,585.

In 1921 Representative Langley introduced a bill (H. R. 2166, 67th Congress, 1st Session) "To increase the area of the United States Botanic Garden." Its removal from its old location on the Mall was necessitated by an Act of Congress locating the General Grant Memorial (completed about 1920) on the site of the Garden. The old site (about 12 acres) was between Maryland Avenue (on the South) and Pennsylvania Avenue (on the North) and the Capitol Grounds and Third St., S.W. This was the main site from 1850 to 1933. The new site lies south of Maryland Avenue. This is chiefly an educational display garden, as the botanical research, herbarium, and botanical library are provided for under other branches of the Federal Government.

WASHINGTON (2)

NATIONAL ARBORETUM

Established: The Congressional Act authorizing the establishment of this Arboretum was passed March 4, 1927, and became a law on the signature of President Coolidge.

Area: Total present (1938) area, 397 acres. There is an area of about 400 acres of federal land which may later be added.

Director: An office with the title, Director, is contemplated; in the meantime the administrative head will be an Acting Director. Dr. Frederick V. Coville was Acting Director from the beginning until his death in January, 1937. Mr. B. Y. Morrison was appointed Acting Director as of October 1, 1937.

Plantations: Up to 1938 no planting has been done except a small

nursery. Care has been given to existing native plants on the property, to soil improvement, and preliminary development of roads and fences.

WASHINGTON (3)

MEDICINAL AND DRUG PLANT GARDENS

Division of Drug Plants, Bureau of Plant Industry, U. S. Dept. of Agriculture, Washington, D. C.

Mimeographed lists of the plants grown may be obtained on request.

Florida

COCONUT GROVE

FAIRCHILD TROPICAL GARDEN

(Also MONTGOMERY PALMETUM)

Established (Dedicated): March 23, 1938. *Area*: 83 acres.

Director (*Superintendent*): K. Dahlberg (1938-).

"The only tropical botanical garden open to the public in continental United States." Prior to March 23, 1938, Colonel and Mrs. Robert H. Montgomery acquired and gave to the Board of Directors (Dr. David Fairchild, President Emeritus; Eleanor F. Montgomery, President) 83 acres of land "situated in the City of Coral Gables adjoining and immediately south of the Matheson Hammock and Dade County Park, east of Cutter Road. Combined with the Dade County property the land runs to and has a frontage of one mile on Biscayne Bay." (Pamphlet, "*Dedication of the Fairchild Tropical Garden, March 23, 1938*," by Marjory Stoneman Douglas.) The Commissioners of Dade County "agreed to cooperate by combining as far as practicable, the entire Matheson Hammock development, comprising several hundred acres, with the Fairchild acquisition. The Dade County Commissioners are not permitted to spend any money on private property, consequently the Fairchild Garden donated and deeded to Dade County 58 acres of land adjoining the Matheson property and the Commissioners have undertaken to develop the 58 acre tract as part of the Fairchild Garden. The remaining 25 acres are retained by the Fairchild Garden and will be known as the Montgomery Palmetum of the Fairchild Tropical Garden."

Colonel and Mrs. Montgomery have also donated to the Garden more than 200 species of palms and flowering trees, with sufficient funds to plant the trees in 1938; also sufficient funds to build roads, walls, etc., in the 25 acre tract, "but funds for proper development, necessary buildings, and maintenance have not yet (1938) been provided."

Membership: Life, \$500; Donors, \$250; Fellows, \$100; Associates, \$50; Sustaining, \$25; Contributing, \$10; Subscribing, \$5.

SEBRING

FLORIDA BOTANICAL GARDEN AND ARBORETUM

Highlands Hammock State Park

Established: May 14, 1934. *Area:* More than 1500 acres.

Direction: The Garden is controlled by the Florida Botanical Garden and Arboretum Association. The first president was John C. Gifford (1934-1936); second president, Abel J. Grout (1936-1937); third president, F. N. K. Bailey (1937-).

The Garden and Arboretum occupy Sections 4 and 33, and Part of 31 and 32, of the Highlands Hammock State Park.

Source of income: Developmental work has been done by the CCC (Civilian Conservation Corps), initially Highlands Camp SP-3, later changed to a new site on Lake Jackson and designated as SP-10. *Library and Herbarium* (about 4000 sheets, 1938) have been started. *Plantations:* Azalea Garden (donated by the Florida Federation of Garden Clubs; Palm Garden; Dahlia Garden; Taxonomic Garden; Nursery. *Arboretum* about 8500 trees and shrubs. *A Wood Collection*, including species native to Florida and others, is being prepared. *Publications:* 1. Report of the Florida Botanical Garden and Arboretum. June 1, 1936, by A. C. Altvater, Project Superintendent, Highlands Camp SP-3, National Park Service. 2. Report on the Botanical Activities of the Florida Botanical Garden and Arboretum. June 1, 1936, by J. B. McFarlin, Wild Life Technician, Highlands Camp SP-3, National Park Service. 3. U. S. Department of the Interior: National Park Service Branch of Planning and State Cooperation, Sebring, Florida, February 20, 1937. By A. C. Altvater, Project Superintendent, Highlands Camp SP-10. This contains a Report by Dr. Abel J. Grout, then president of the Florida Botanical Garden and Arboretum Association. The above three reports were published in mimeograph (or multigraph) form. There is also a small printed folder, anonymous, entitled, "Florida Botanical Garden and Arboretum: A Going Project."

Georgia

LIBERTY COUNTY

BOTANIC GARDEN OF LOUIS LeCONTE (DISCONTINUED)

Established: About 1810 (?).

Note: "Years ago Georgia could boast several small botanic gardens. Mr. Louis LeConte had a delightful small botanic garden about his home in Liberty County."

MAXEY

LINDSEY PHYSIC GARDEN (DISCONTINUED)

Established: About 1810 (?).

Note: "Coeval with the LeConte garden [in Liberty County, Georgia] Dr. Lindsey Durham, of Maxey, Ga., maintained a physic garden on his plantation and from this garden procured a large part of the materia medica for his practice." (*Garden Gateways*. Pub. by Garden Club of Georgia, Atlanta. 4: 1. Sept. 1917. Citation for this and the preceding quotation.)

Idaho

MOSCOW

CHARLES HUSTON SHATTUCK ARBORETUM

School of Forestry, University of Idaho

Established: 1909. *Area:* "15-20 acres."*Directors:*

1. Charles H. Shattuck (1909-1917)
2. Francis G. Miller (1917-1934)
3. Richard E. McArdle (1934-1935)
4. Dwight S. Jeffers (1935-)

Serves as a public park. Open free at all times. *Source of income:* Appropriations by the State of Idaho. *Herbarium:* About 1000 specimens. *Plantations:* Systematic. Reports more than 9000 specimens under cultivation. *Affiliated* with the University of Idaho.

Illinois

CHICAGO (1)

DUNE FOREST GARDENS (ABANDONED)

Dune Forest Company, 77 West Washington St., Chicago

Established: 1927. *Area:* 100 acres.

Director (In charge): Paul Carpenter Standley, of the Field Museum, Chicago. (1928–1930)

Note: About 1927 The Dune Forest Company subdivided a piece of wooded and hilly property in the sand dune region of northern Indiana, adjacent to the Indiana Dunes State Park. It was the plan of the Forest Dune Company to “improve” 100 acres, and to leave the balance in its natural condition. During the world-wide economic depression the property was lost to the owners, and apparently the project, which started out with so much promise, has been abandoned.

CHICAGO (2)

(BOTANIC GARDEN OF THE UNIVERSITY OF CHICAGO)

Department of Botany, University of Chicago

An Associated Press dispatch, in 1934 announced that the University of Chicago had “set aside a tract of land for the establishment of a botanic garden at some future date.” Official information received from the University Department of Botany, states that the University “has no botanic garden properly so-called, nor do we term the experimental plots a botanic garden.”

JOLIET

PILCHER ARBORETUM

Established: 1920. *Area:* 327 acres.

Administered by the Park Superintendent under the direction of the Board of Park Commissioners, Joliet. Open free daily at all hours. *Source of income:* Tax budget of the city. This area, formerly the estate of H. N. Higginbotham, was purchased by Mr. Robert Pilcher and given to the city to administer as a public arboretum.

LISLE

MORTON ARBORETUM

Lisle, Du Page County

Established: Development begun, Fall, 1921; Founded, December 14, 1922. Administration Building in memory of Mr. Joy Morton, founder, completed November, 1935. *Area:* 735 acres. *Director (Superintendent):* C. E. Godshalk (1921–).

Admission: Free, daily, from sunrise to sunset. *Source of income:* Endowment (\$675,000) made by the late Joy Morton, founder. *Library:* 2000 volumes. *Herbarium:* 10,000 specimens. The *Arboretum* (with *Fruticetum*) is situated on State Highway No. 53, in Du Page County, approximately 25 miles west of the Chicago Loop, 1 mile north of Lisle, and 3 miles south of Glen Ellyn. *Plantations:* Systematic, geographic, horticultural. Plants for landscape effect are chiefly along the boundaries of the Arboretum and borders of streams, lakes, and drives. In the forestry plantings are large groups of trees valuable for forestry purposes, whose economic and practical value is being tested. *Publication:* Bulletin of Popular Information. Seed Exchange List.

Indiana

HUNTINGTON

LOEW BOTANIC GARDEN AND ARBORETUM

Huntington College

Founded: Fall of 1935. *Dedicated:* June 12, 1937. *Area:* Garden, 3.5 acres; Arboretum, 40 acres.

Director: Fred Aron Loew (1937–).

Open free daily. *Plantations:* Largely systematic, with more than 450 species. It is planned to devote one section entirely to native grasses. *Arboretum* now well wooded with many of the trees and shrubs native to the region. "Others will be planted until it is complete. . . . The development of this garden and arboretum which is the only project of its kind in the state, is the work of Fred A. Loew, now professor of botany, and has been named after him." (*Science* 86: 99. 30 July, 1937.) The dedication address was given by Dr. Ernst A. Bessey, professor of botany, Michigan State College, and from 1911 to 1914 director of the Beal Botanic Garden, East Lansing.

INDIANAPOLIS (1)

HOLLIDAY BOTANIC GARDEN AND ARBORETUM

General Superintendent, Department of Public Parks

Note: The following information was supplied under date of March 22, 1937, by Mr. A. C. Sallee, Gen'l. Supt.

"Several years ago the late John H. Holliday, founder of the *Indianapolis News*, presented his country estate, consisting of some 80 acres, to the City of Indianapolis to be used for a public park. On account of the unprecedented business depression during the past few years and the uncertainty of raising taxes, this tract has not been developed as a city park. Recently Mr. Willard N. Clute, the Indiana Nature Study Club, and members of the Indianapolis Council of Garden Clubs, which organization has cooperated with the Park Board in a campaign of city beautification, have agreed that the Holliday estate would be the ideal site for a botanic garden and arboretum."

A landscape architect has been employed to assist in the development of this garden. It is planned to perfect a strong citizen organization to cooperate with the Park Board and provide continuity for the operation of the garden, possibly the raising of an endowment fund, and the employment of a "Botany Director."

The following information was supplied under date of May 4, 1938, by Mr. A. C. Sallee.

"The Holliday botanic garden and arboretum is still under development and will not be open to the public until the latter part of 1939. As planned, the garden will contain a collection of rare, curious, and otherwise interesting plants that will survive the winter in this climate; a conservatory, various special collections of herbs and wildflowers, as well as sand, water, bog, and rock plants, a library of books on botany and gardening, a reading room, and an auditorium for garden meetings, lectures, etc.

"Quite a few rare specimens have been transplanted from the Butler botanic gardens to Holliday this spring and a large planting program is being outlined for the fall of 1938. Dr. Willard N. Clute of Butler University has been employed in an advisory capacity."

INDIANAPOLIS (2)

BOTANICAL GARDEN OF BUTLER UNIVERSITY

Butler University, Indianapolis, Indiana

Established: 1928. *Area:* 15 acres.

Director: Willard N. Clute (1928—)

Serves as a public park. Open free every day, all day. *Source*

of income: Funds appropriated by the University. *Library:* About 3000 volumes available at the University Library. *Herbarium:* 40,000 specimens. *Plantations:* Largely systematic. There is an *Arboretum*, a *Fruticetum*, a Herbaceous garden, Sand garden, Native Wildflower garden, Rock garden, and Water garden. *Special lectures* are given to school children at the garden, also to clubs, garden societies, and general public. *Study material* is supplied to local schools on application.

MICHIGAN CITY

INTERNATIONAL FRIENDSHIP GARDENS

Chamber of Commerce Building

Established: May 28, 1934. *Area:* 100 acres.

Director: J. V. Stauffer, Executive Director (1934—).

Located on U. S. Highway No. 12, one and one-half miles east of Michigan City.

Serves as a public park. Open daily, May to December. Adults, 25 cents; children, 10 cents. Described as a "scientific and philanthropic" garden. *Source of income:* Endowment funds. *Library:* Proposed but not yet (1938) started. *Herbarium:* 1000 specimens. *Arboretum.* *Fruticetum* proposed. *Publications:* Administrative only. *Special lectures and study material* given to school children. On the letterhead the following features are listed: "Many acres of gardens; Botanical Gardens, Horticultural Gardens, Arboretum, Scientific and Experimental Gardens, Trees of Centuries, Special Zoo."

MUNCIE

ARBORETUM OF BALL STATE TEACHERS COLLEGE

Established: 1918. *Area:* 18 acres.

Director:

In charge of the head of the science department. O. B. Christy (1918—).

The grounds adjoin the college campus; they are used by students of the college and the demonstration school and pupils of the city schools. Planting of spring flowers began in 1919. The area is reported to contain "a good representation of all the herbaceous and woody plants of Indiana" which will grow under local conditions. The arrangement is systematic. *Herbarium:* 1000-1200 specimens.

Iowa

AMES

IOWA STATE COLLEGE ARBORETUM

Established: 1934. *Area:* Arboretum, 70 acres; Herbaceous Garden, 5 acres.

Not yet open to visitors. Being developed by the Federal Civilian Conservation Corps (CCC). *Source of income:* Taxes.

GRINNELL

BOTANIC GARDEN OF GRINNELL COLLEGE

Established: 1908. *Area:* 1 $\frac{5}{6}$ acres.

Director: Henry Shoemaker Conard (1908—).

The Garden was established by subscription of funds, the subscriptions closing December 31, 1908, payable within three years. The sum now set aside as a special endowment for the garden is \$1630.00. Some additional funds are supplied by the botany department in return for materials used by the department. A considerable amount of work in the garden is done as class exercises by students of horticulture. The first plantings were in 1909, with 14 species. In 1910 about 100 more were added. Since that time the number has fluctuated greatly.

The Garden is administered by the Professor of Botany of Grinnell College. The College Laboratories contain herbaria of about 20,000 sheets. No seed list or other publications are issued, but seeds and plants are gladly supplied when possible.

MCGREGOR

IOWA MEMORIAL ARBORETUM ASSOCIATION

Florence S. Chapin, Secy.-Treas.,

2306 Uplands Drive, Cedar Rapids, Iowa

Established: 1932. *Area:* 20 acres.

Open free at all times. *Source of income:* Contributions. *Museum:* Building built in 1936. *Publications:* In preparation, Reports on the botany, geology, and history of the region.

Kentucky

LEXINGTON (1)

KENTUCKY BOTANIC GARDEN

Lexington

Established: 1927. *Area:* About 7 acres.

Directors: A joint committee from the Lexington Garden Club and the University of Kentucky. Prof. N. R. Elliott, Chairman, Miss Mary L. Didlake, Sec. and Treas.

Serves as a public park. Open free daily. *Source of income:* Appropriations from University and donations from Kentucky Garden Clubs. *Library and Herbarium:* Those of the University and the Experiment Station. *Plantations:* Mainly under ecologic heads. *Arboretum.* *Affiliation:* The Garden is affiliated with the University of Kentucky and is under its management.

LEXINGTON (2)

BOTANIC GARDEN OF TRANSYLVANIA UNIVERSITY (Abandoned)

Louisiana

NEW ORLEANS

ARBORETUM

In 1934 plans were initiated in New Orleans for the development of an Arboretum as a part of the City Park extension. Much preliminary work has been done on the site by W.P.A. (U. S. Works Progress Administration) labor. The New Orleans Academy of Sciences, in cooperation with several scientific and civic organizations of the city, has been interested in furthering the project.

Maine

THOMASTON

KNOX ARBORETUM

R. F. D. No. 1

Established: 1908. *Area:* 100 acres.

Director: Norman Wallace Lermond (1908—).

Serves as a public park. Open free, daily. *Source of income:*

Public contributions. *Library*: 500 volumes; 700 pamphlets. This is the Knox Academy Library. *Herbarium*: Approximately 800 specimens. *Plantations*: Systematic. *Publications*: Lists of trees and shrubs, two having been issued by the Garden to date (1934). *Museum*: Finished (1937) by State of Maine: \$15,000 expended by Governor and Council. *Affiliation*: Owned by the Knox Academy of Arts and Sciences, Thomaston.

Maryland

BALTIMORE

BOTANIC GARDEN OF THE JOHNS HOPKINS UNIVERSITY

Established: 1909. *Area*: 2 acres.

Director: Duncan Starr Johnson (1909–Feb. 18, 1937).

Plantations: 1. Morphologic-ecologic; 2. Structure and ecology of reproductive organs; 3. Systematic; 4. Useful and ornamental shrubs.

COLLEGE PARK

UNIVERSITY OF MARYLAND ARBORETUM AND BOTANICAL GARDEN

Established: 1933. *Area*: 30 acres.

Director: A. S. Thurston (1937).

Open free daily. *Source of income*: Taxation.

According to Robert Pyle (Amer. Assoc. of Nurserymen: Report of the Comm. on Botanical Gardens and Arboretums, July, 1937), the movement for this arboretum was initiated by Maryland nurserymen, who have six men on the Arboretum Committee; the College has eight men.

Massachusetts

CAMBRIDGE

BOTANIC GARDEN OF HARVARD UNIVERSITY

Botanic Garden, Garden Street, Cambridge

Established: 1807. *Area*: 7 acres.

Directors (or Chief Administrative Officers):

1. William Dandridge Peck (1807–1822)
(Vacant 1823–1824)
2. Thomas Nuttall, Curator (1825–1834)
3. Asa Gray (Professor in Charge) (1842–1873)

4. Charles Sprague Sargent, first Director (1873–1879)
5. George Lincoln Goodale, Director (1879–1909)
6. Oakes Ames, Director (1909–1922)
7. Stephen F. Hamblin, Director (1923–1930)
8. Robert H. Woodworth, Curator (1930–1935)
9. Elmer D. Merrill, Supervisor (1935–)

Source of income: A small endowment, \$78,491.68, and gifts. Previously it received some aid from Harvard College in compensation for illustrative material supplied. *Library:* The Garden has on its premises, and of easy access, the Library of the Gray Herbarium, amounting to about 39,600 volumes and pamphlets. *Herbarium:* The Gray Herbarium, of Harvard University (about 950,000 sheets). *Plantations:* Systematic. *Arboretum and Fruticetum:* (Harvard University, of which the Botanic Garden is a small part, has all of these well developed at the Arnold Arboretum, Jamaica Plain, *q.v.*). The chief function of the Botanic Garden is to supply illustrative material for class use. *Affiliation:* Formerly a separate Department of Harvard University. In 1928 it was made a part of the Department of Botany of the University; it is now one of the nine separately endowed units under the general supervision of the Administrator of Botanical Collections, Harvard University. It is maintained solely on the basis of those species hardy in New England, as all of the greenhouses were removed in 1935. It is the oldest botanic garden in the United States that has consistently been maintained as such since its establishment in 1807. Much amplification of its work is impossible because of limited space and limited income. *Note:* For Atkins Institution, Soledad, Cuba, see under Cuba, Soledad.

JAMAICA PLAIN

ARNOLD ARBORETUM OF HARVARD UNIVERSITY

Established: 1872. The principal collections of trees and shrubs were not planted until 1886. *Area:* 265 acres.

Directors: Charles Sprague Sargent (1872–1927); Elmer D. Merrill (1937–).

Supervisors: Oakes Ames (1927–1935); Elmer D. Merrill (1936).

Note: The Arnold Arboretum owes its origin to Mr. James Arnold, a merchant of New Bedford who died in 1868, leaving to the trustees of his estate \$100,000 to be devoted to the advancement of agriculture or horticulture. The trustees assigned the in-

itial endowment to Harvard University provided that a part of the Bussey farm, already owned by the University, be set aside as the site of an arboretum, and that such an institution be established. This was accomplished in 1872. Ten years later arrangements were consummated with the City of Boston whereby the property was deeded to the city and then leased by the Arboretum for \$1.00 per year for a term of 999 years, with provision for renewal for another 999 years. Under this arrangement the Arboretum became a part of the Boston park system and the City of Boston became responsible for the construction and maintenance of boundary fences, drives, walks, and benches, granted certain water rights, and provided for police protection.

Serves as a public park. Open free, daily, from sunrise to sunset. *Source of income:* Interest from endowment (\$2,964,548.84); special contributions. *Library:* About 43,500 bound volumes; 12,100 pamphlets; 17,850 photographs. *Herbarium:* About 500,000 specimens, representing the woody plants (only) of the world; Carpological collection 8400; Wood collection 4000. *Conservatories:* As the arboretum includes only woody plants, hardy in the climate of Jamaica Plain (near Boston), there are no plant houses except those necessary for propagation work and research in plant pathology and genetics. *Plantations:* In part systematic, in part for landscape effect.

1. *Arboretum.* Stated by the authorities (in 1934) to contain the largest number of species of woody plants assembled in any one place in America. (More than 6500 species and varieties of trees, shrubs, and vines representing about 339 genera.)

2. *Fruticetum.* The Shrub Collection "is arranged in beds ten feet wide, with a total length of 7765 feet, and separated by grass covered paths five feet wide. In these beds the shrubs are planted in a single row and in botanical sequence, all the species of a genus being thus brought together. In this collection only those genera are included in which all the species are shrubs, while those genera which contain trees and shrubs, like *Cornus*, *Syringa*, *Viburnum*, *Rhamnus*, *Rhus*, *Evonymus*, *Rhododendron*, etc., are planted in other parts of the Arboretum and as near as possible to the other genera of their natural families.

"The object of this special Shrub Collection is to enable students, landscape-gardeners, and nurserymen to compare readily the different shrubs which are available for planting in the North-

ern States; to make the collection as valuable as possible for this purpose only well-known hardy shrubs are included in it. Less hardy and all imperfectly known shrubs will be found in more sheltered and less conspicuous positions, where supplementary collections of most of the prominent genera of shrubs are maintained."

3. *Crataegus collection*. "About 1300 species, forms, and varieties of this genus are now represented in this collection. The plants were nearly all produced at the Arboretum, from seeds carefully gathered from the individual trees which served as the types from which the species were described. The plants are in square beds, and several individuals of each species are planted together; then as these grow they are reduced to one or two plants of each variety. Diagrams of each bed are kept on cards, and the name, history, position, and final distribution of each individual are recorded."

4. *Pinetum*, containing the pines and other Gymnosperms.

5. *Special features*: In addition to the beautifully landscaped grounds and very large collections of hardy woody plants, several features are worthy of special note. These include Hemlock Hill, a beautiful natural group of the native hemlock (*Tsuga canadensis*), a great lilac collection, containing in excess of 400 named species and varieties, vast collections of azaleas, attractive mass plantings of rhododendrons and laurel, extensive plantings of oriental cherries and crab apples, and the remarkable Larz Anderson collection of dwarfed Japanese trees, the latter presented in 1937.

Publications: Shaw, G. R., *The Pines of Mexico*. Boston. 1909.—Rehder, Alfred, *The Bradley Bibliography; a guide to the literature of woody plants published before the beginning of the twentieth century*. 5 vol. Cambridge. 1911–18.—Sargent, C. S., *Plantae Wilsonianae; an enumeration of the woody plants collected in western China*. 3 vol. Cambridge. 1911–17.—Shaw, G. R., *The Genus Pinus*. Cambridge. 1914.—Tucker, Ethelyn M., *Catalogue of the Library of the Arnold Arboretum*. 3 vol. Cambridge. 1914–33.—Wilson, E. H., *The Cherries of Japan*. Cambridge. 1916.—Wilson, E. H., *The Conifers and Taxads of Japan*. Cambridge. 1916.—Wilson, E. H., and Rehder, Alfred, *A Monograph of Azaleas*. Cambridge, 1921.—

Leavitt, R. G., The Forest Trees of New England. Jamaica Plain. 1933. Merrill, E. D., and Walker, E. H., Bibliography of Eastern Asiatic Botany. Baltimore. 1938.—McKelvey, Susan D., Yuccas of the Southwestern United States. Jamaica Plain. 1938. Bulletin of Popular Information. Issued during spring, summer and autumn, about 15 numbers per year. \$1.00 per year.—Journal of the Arnold Arboretum. Quarterly. \$4.00 per year.—Contributions from the Arnold Arboretum. Issued at irregular intervals. A Guide to the Arnold Arboretum (with map). Jamaica Plain. 1934.

Note: See also Cuba: Soledad (Atkins Institution of the Arnold Arboretum).

LEXINGTON

THE LEXINGTON (MASS.) BOTANIC GARDEN, INC.

93 Hancock St.

Established: 1930 (Incorporated, 1932). *Area:* 12 acres.

Director: Stephen Francis Hamblin (1930—).

Admission free daily. *Source of income:* Bequests and gifts. *Plantations:* Wholly for herbaceous plants. Engler and Prantl system. Specializing on North American species and rock garden plants. *Publications:* Seed Exchange List; Bulletin; Lexington Leaflets.

NORTHAMPTON

BOTANIC GARDEN OF SMITH COLLEGE

Established: 1893. *Area:* About 4 acres for the Herbaceous Garden; the Arboretum and Fruticetum include the College Campus of 120 acres, and the woods adjoining.

Directors: William Francis Ganong (1894–1932).

Since 1932 there has been no official with the title of director, but the Garden has been under the management of the Botanical Department of the College, Dr. Wayne E. Manning, Chairman (1938).

Open free, daily, to the public. *Library:* That of the Department of Botany. Specially rich in books on the history of botany and botanical education. *Herbarium:* About 27,000 sheets. *Plantations:* Systematic. Hardy Herbaceous Plants, 1000. *Arboretum:* 350 species. Species under glass, 1400. *Fruticetum:* 550 species.

SOUTH HADLEY

CLARA LEIGH DWIGHT BOTANIC GARDEN

Mount Holyoke College, South Hadley

Established: 1878. *Area:* 10 acres, garden and arboretum.*Directors:*

1. Lydia White Shattuck (1878–1887)
2. Henrietta Edgecomb Hooker (1887–1900)
3. Asa Stephen Kinney (1900–)

Open free, daily, except Sundays, 9 a.m. to 5 p.m. Source of income: Income from endowment and College. *Herbarium:* Over 8000 specimens, representing nearly 1600 genera. *Plantations:* Herbaceous garden. *Arboretum* (about 150 species of trees and shrubs). *Species under glass:* 300. Herbaceous plants out-of-doors: 125 species.

SOUTH SUDBURY

GARDEN IN THE WOODS

Established: 1932. *Area:* 30 acres.*Director (owner):* Will C. Curtis (1932–).

Always open to the public free. Guides free for garden clubs and classes. Described as a “Wild Flower Sanctuary and Botanical Garden,” comprising woodland, meadow, hills and valleys, with a brook and ponds, and open bogs. On Raymond Road, 20 miles from Boston. The owner is bringing together all the native plants hardy at this place, and carrying on experiments with their propagation and cultivation. Winter lectures and bureau of public information on wild flowers. Specialty in albino forms of wild flowers, and alpenes of Eastern United States.

WALTHAM

BOTANIC GARDEN OF MIDDLESEX UNIVERSITY,

COLLEGE OF MEDICINE AND SURGERY

An Associated Press dispatch of June 15, 1928, announced that this college was developing its then newly acquired campus at Waltham as a botanic garden. “More than an acre will be cultivated for botanical study” from the medical point of view. As of April 8, 1938, “We have temporarily halted our activities in the development of . . . the large plot of ground on the campus

of Middlesex University which we hope in the future to develop for botanical purposes for the study of pharmaceutical preparations."

WELLESLEY

ALEXANDRA BOTANIC GARDEN AND HUNNEWELL ARBORETUM OF WELLESLEY COLLEGE

Established: 1923. *Area:* 24 acres. 20 additional acres for genetics, ecology, and horticulture.

Directors: Margaret Clay Ferguson (1923–1932); Helen Isabel Davis (1932–).

Open free, daily. Source of income: Endowment, \$60,000. In addition Wellesley College maintains the large trees (pruning, spraying, etc.), walks, electric lights, and water supply. *Herbarium:* More than 85,000 specimens.

Michigan

ANN ARBOR (1)

BOTANICAL GARDENS OF THE UNIVERSITY OF MICHIGAN

Established: 1914. *Area:* 51 acres.

Directors: Henry Allan Gleason (1915–February, 1919); Harley Harris Bartlett (1919–).

Source of income: Budget of the University of Michigan. *Plantations:* The more notable features of the outdoor plantings are an extensive wild rose collection, a large collection of species and varieties of *Prunus*, and a great many of the varied introductions of the Office of Foreign Plant Introduction of the U. S. Department of Agriculture.

The School of Forestry of the University maintains its nurseries at the Gardens. The greenhouse collections are (1937) chiefly remarkable for the large cactus collection. The facilities of the Garden provide for bringing into flower, for identification and study, many plants which are collected by various university expeditions.

Affiliation: The Botanical Gardens constitute an independent department of the College of Literature, Science, and the Arts. Facilities for scientific investigation are offered to all Departments of the University, and have been utilized, not only by the Department of Botany, but also by the School of Forestry and Conserva-

tion, the School of Pharmacy, and the Department of Zoology. *Historical Notes:* Dr. H. H. Bartlett has kindly supplied the following historical information:

The earliest intimation that there was to be a Botanical Garden dates from the reorganization of the University in Ann Arbor just a hundred years ago, when Asa Gray, the first professor to be appointed, made a plan for the development of the campus, which showed the eastern half of the original forty acres as "The Botanical Garden." Gray was sent to Europe to buy books, and because of his appointment at Harvard he never returned to Ann Arbor, and this plan remained unrealized.

A small Botanical Garden on the campus was ultimately established by Volney Morgan Spalding, professor of botany, 1885–1904. The first notice of it in the University Calendar appears in the volume for 1901–1902. It was under the direction of Julius Otto Schlotterbeck, then Assistant Professor of Pharmacognosy and Botany in the School of Pharmacy, and occupied an area in front of and extending to the westward of the General Library. The only recognizable trace of it that now remains is a tree of *Fraxinus Ornus* near the northwest corner of the Library.

The space on the campus for the Garden was too small. The City of Ann Arbor owned thirty acres of land along the Huron River which it was willing to use as the nucleus of a new Botanical Garden. Additions were made to it by gifts to the University from Dr. Walter H. Nichols and his wife and from Professor F. C. Newcombe of the Department of Botany.

The development of the Huron River site was begun in 1906, and in the Calendar for 1906–1907 Assistant Professor George Plumer Burns, of the Department of Botany, is listed as Director of the Botanical Gardens. This position he held from 1907 to 1910, being succeeded by Charles H. Otis as "Curator of the Botanic Garden and Arboretum" (1910–1912). The Department of Botany continued the administration until 1915. The land was hilly and although admirably suited for permanent display plantings of woody species and for landscape effects, it offered no sufficient flat area for a large greenhouse plant and experimental fields, in which the Department of Botany was especially interested.

The University therefore purchased, in 1914, the initial twenty acres of the present site to the west of Packard Road on the line between Ann Arbor and Pittsfield townships. The botanists transferred to the Packard Road site in 1915, leaving the land along the river subsequently known as the "Nichols Arboretum" to be administered by the Department of Landscape Design. This arrangement is still (December, 1936) in effect. Dr. Henry Allan Gleason was the first Director of the Botanical Gardens on the Packard Road site.

ANN ARBOR (2)

THE NICHOLS ARBORETUM OF THE UNIVERSITY OF MICHIGAN

Established: 1907. *Area:* About 90 acres.

Directors:

As University Botanic Garden and Arboretum.

1. George Plumer Burns (Botanic Garden) (1907–1910)
2. Charles Herbert Otis (Curator, 1910–1912); Acting Director (1912–1913)
3. Henry Allan Gleason (1913–1919)

As Nichols Arboretum.

4. Aubrey Tealdi (1919–1934)
5. Harlow O. Whittemore (1934–)

Open free to the public at all times. *Source of income:* University of Michigan budget (State of Michigan funds). *Library:* Same as that of Department of Landscape Design; about 5000 volumes. *Herbarium:* No herbarium separate from that of the Department of Botany. *Plantations:* Systematic, ecologic, geographic. *Publications:* Nichols Arboretum Bulletin; Trees and shrubs hardy in southern Michigan. *Supplies living plant material* to schools for study on request. Plans have been made to increase the area to 160 acres. *Note:* The Botanic Garden and Arboretum were combined until 1915 when the Botanic Garden was moved to a new site better adapted to its work.

BATTLE CREEK

LEILA ARBORETUM

City Hall, Battle Creek

Established: 1922. *Area:* 80 acres.

Director: Commissioner of Parks, Buildings, and Grounds.

Open free from sunrise to sunset. *Source of income:* City appropriations. *Plantations:* Systematic. *Lectures* are given to school children in the Kingman Museum of Natural History, located in the Arboretum. *Study collections* loaned to schools.

EAST LANSING

BEAL BOTANIC GARDEN

Michigan State College, East Lansing

Established: 1877. *Area:* Slightly more than 3 acres.

Directors:

1. William James Beal (1877–1910)
2. Ernst Athearn Bessey (1911–1914)
3. Henry Townsend Darlington (1915–1930)
4. H. L. H. Chapman (Superintendent) (1931–)

Serves as a public park. Open free, daily. *Source of income:* Appropriations from Michigan State College. No separate appropriations. *Library:* The Library of the Botany Department. *Herbarium:* About 90,000 specimens, belonging to the Department of Botany. *Plantations:* Systematic, economic, local flora. *Conservatories:* A small range. *Publications:* Seed Exchange List (annually). *Lectures* are given to school children at the garden on request. *Living material supplied for study* to local schools occasionally. "Perhaps the greatest service that the Garden does is as an acclimatization experiment station."

HILLSDALE

SLAYTON ARBORETUM AND BOTANICAL GARDEN

Hillsdale College

Established: 1922. *Area:* 91 acres.

Director: Bertram Alpha Barber (1922–).

Serves as a public park, open free daily. *Source of income:* Partly Hillsdale College but mostly private subscription. *Supplies living plant material* for study to local schools.

YPSILANTI

SCIENCE GARDENS

Michigan State Normal College

Established: 1904. *Area:* One acre.

Directors: W. H. Scherzer (1904–1919); John Milton Hover (1919–).

Open free, daily. Source of income: State appropriation. *Herbarium:* About 4000 specimens. *Arboretum* of native trees. *Fruticetum* of the more common ornamentals. *Plantations* are arranged systematically, and are intended primarily to serve as teaching collections for botany classes. *Publication:* Flora of Washtenaw County, by B. A. Walpole. *Special lectures* are given to school children, and *study collections* are loaned "to training schools only." *Affiliation:* Michigan State Normal College.

Minnesota

LAKE CITY

UNDERWOOD ARBORETUM AND STATE GAME REFUGE

Established: January 1, 1931. A memorial to J. M. Underwood.

Area: 500 acres.

Director: R. D. Underwood. Open free, daily.

MINNEAPOLIS (1)

THE MEDICINAL PLANT GARDEN OF THE COLLEGE OF PHARMACY, UNIVERSITY OF MINNESOTA

Established: 1892-93 by Dean Frederick J. Wulling. *Area:* 3 acres.

Director: Frederick John Wulling (1892-).

Open free to public inspection. High school classes, women's clubs, and other organizations are frequent visitors. *Source of income:* Garden produces no monetary income except in a small way from the digitalis which it prepares for those pharmacists who have physicians' specifications for Minnesota University digitalis. The expenses of the Garden are carried by the general College of Pharmacy Budget. The Garden is not supported by any special governmental appropriation, but about 49.5 per cent of the Pharmacy Budget, out of which the Garden is maintained, comes from the State of Minnesota. *Library:* The departmental library of the College of Pharmacy contains about 4000 volumes, and all of the pharmacy periodicals of this country and the important ones of other countries. The students in pharmacy have access to all of the library facilities of the University. *Herbarium:* About 5000 specimens, but the students in pharmacy have access to the herbarium and other facilities of the Department of Botany, College of Science, Literature and Arts. *Plantations:* Largely systematic.

MINNEAPOLIS (2)

UNIVERSITY OF MINNESOTA BOTANIC GARDEN

Area: 3 acres. Administered by the Department of Botany chiefly as a source of study material.

NORTHFIELD

CARLETON COLLEGE ARBORETUM

Established: 1926. *Area:* 350 acres.

Superintendent: D. B. Stewart (1937).

Open free daily. *Source of income:* Gifts.

ST. CLOUD

STATE TEACHERS COLLEGE

A letter of December 26, 1934 from the Department of Biology, State Teachers College, St. Cloud, states as follows:

"Our State Teachers College has acquired about a square mile of islands in the Mississippi river near the College. In addition we own one hundred and twenty acres which formerly was a granite quarry. We would like very much to establish (1) a botanical garden and tree plantings on the quarry site and (2) an arboretum on the islands."

"More than 25,000 evergreen seedlings have been obtained from the state nurseries and placed in transplant rows." (*Letter of September 4, 1938 from W. C. Croxton.*)

Missouri

ST. LOUIS

MISSOURI BOTANICAL GARDEN

Established: The grounds locally known as "Shaw's Gardens," were opened to the public in 1859, but its formal opening as a botanical institution took place upon the organization of the trust, in the fall of 1889. Founded by Henry Shaw, of St. Louis, who gave the original building and planted grounds, and the initial endowment.

Area: City Garden, 75 acres; Arboretum, Gray Summit, Mo. (near St. Louis), 1600 acres.

Directors: William Trelease (1889–1912) ; George Thomas Moore (1912–).

Open free, daily except New Year's and Christmas; on weekdays from 8 a.m. to one-half hour after sunset; Sundays from 10 a.m. to sunset. *Source of income:* Endowment, about \$5,000,000. Annual Budget: Approximately \$150,000. *Library:* Chiefly reference, with a limited circulation. Total number of volumes about 52,000; number of pamphlets nearly 79,000; manuscripts, 339. Number of periodicals regularly received, 1400. *Herbarium:* About 1,254,000 specimens. *Plantations:* In St. Louis, iris, rose, medicinal plant, formal and water gardens. At the arboretum (at Gray Summit), pinetum, native wild flower plantations, azalea-rhododendron garden, flowering crab, cherry, and apple orchards. *Species under glass:* 6500. *Herbaceous plants out of doors:* 7500.

Publications:

Missouri Botanical Garden Bulletin, established Jan. 1913. Monthly. Subscription \$1.00 a year. Not a scientific publication, but “devoted almost exclusively to informing the people of St. Louis and vicinity what can be seen and learned at the Missouri Botanical Garden.” Contains the annual report of the Director.

Annals of the Missouri Botanic Garden. Established March, 1934. Quarterly. Subscription \$6.00 a volume.

The *Annals* and the *Bulletin* together take the place of the *Annual Report* (1890–1912). *The Twenty-third Annual Report* (1912) marked the close of that publication.

Museum: Henry Shaw Museum, containing relics pertaining to the life of Henry Shaw and the history of the founding of the Garden.

Lecture Courses: Course for amateur gardeners, and an advanced course on gardening and allied subjects. January–April. Lectures on gardening and allied subjects are delivered by members of the staff before various organizations, outside the Garden.

Affiliations: Washington University, St. Louis, Mo. The Director of the Garden is “Engelmann Professor of Botany” in the Shaw School of Botany of Washington University.

School for Gardeners: There is a provision for six garden apprenticeships which provides for three years' training in general horticulture, forestry, and other subjects. The students work full time in the Garden under the heads of the various departments.

New Jersey

TRENTON

PACK MEMORIAL ARBORETUM (Washington Crossing State Park)
State Forester, Dept. of Conservation & Development, State House
Annex, Trenton, N. J.

Established: May 19, 1932. *Area:* 10 acres.

Direction: N. J. State Board of Conservation & Development.

Director: C. P. Wilber (1938).

Serves as a public park. Open free daily. *Source of income:* State appropriations. There is an *Arboretum*. *Plantations:* Geographic and morphologic.

New York

BROOKLYN (1)

BROOKLYN BOTANIC GARDEN

1000 Washington Avenue

Established: 1910 (Authorized December 10, 1909). *Area:* 50 acres.

Director: Charles Stuart Gager (July 1, 1910—).

Serves as a public park. Open free, daily. *Sources of income:* Private funds and New York City Tax Budget Appropriation. *Endowment:* \$1,354,000.

Membership: Seven (7) classes, as follows:

Benefactor (on payment of \$100,000 or more)

Patron (on payment of \$25,000 or more)

Donor (on payment of \$10,000 or more)

Permanent member (on payment of \$2,500 or more)

Life member (on payment of \$500 or more)

Sustaining member (\$25 a year)

Annual member (\$10 a year)

Library: Reference. 19,800 volumes and 16,600 pamphlets. Current periodicals received, more than 1000. *Herbarium:* About 150,000 specimens, including Phanerogams and Cryptogams.

Plantations: Systematic, Ecologic, Horticultural, Special Gardens (Rose Garden, Rock Garden, Japanese Garden, Local Flora, Wall Garden, Water Gardens, Children's Garden, Shakespeare

Garden, Medicinal Plant Garden, Culinary Herb Garden.)

Publications: *Ecology*, quarterly; *Genetics*, bi-monthly; *Contributions*, irregular; *Memoirs*, irregular; *Record*, quarterly (includes Educational Prospectus, Seed Exchange List, and Annual Report); *Leaflets*, bi-monthly.

Lectures and Classes: Lectures are given to adults and children in addition to courses of instruction and supervision of research for advanced students. In 1938 the attendance at visiting classes from schools was 51,214; at regular Botanic Garden classes, 51,154. Classes for blind children were inaugurated. Radio talks on the Botanic Garden and on botany and horticulture are given in cooperation with the Radio Garden Club and otherwise; 33 broadcasts in 1938. *Study collections* and lecture texts with lantern slides to loan to schools. *Living material for study* was supplied in 1938 to 3762 teachers for the instruction of more than 177,400 pupils in all five Boroughs of Greater New York; in addition 1342 Petri dishes filled with sterilized nutrient agar. *Penny packets of seeds* (flower and vegetable), to the number of nearly one million a year, are supplied to children for planting in school and home gardens. *Affiliations:* By formal agreements graduate research conducted at the Garden is credited toward requirements for advanced degrees by New York University and Long Island University. The Garden is a Department of The Brooklyn Institute of Arts and Sciences.

BROOKLYN (2)

HUNT HORTICULTURAL AND BOTANICAL GARDEN (Discontinued)

(Called also The Brooklyn Hunt Botanical Garden)

Incorporated: April 9, 1855.

Note: Three city blocks east of Fifth Avenue, Brooklyn and between 57th and 60th Streets, and \$87,000 were given by Thomas Hunt, William C. Langley, and Henry A. Kent. The movement was started by The Brooklyn Horticultural Society incorporated in April, 1854. The plan was abandoned within one year, but no reason for the failure has apparently been left on record. The site is now completely covered with buildings. The land was deeded back to the original three donors.

BROOKLYN (3)

PARMENTIER'S GARDEN (Discontinued)

Established: October, 1825. *Area:* 23 acres.

Note: The site was "between the Jamaica and Flatbush roads," on the outskirts of what was then the City of Brooklyn. It was near the present Brooklyn Terminus of the Long Island R. R. It is recorded (Records, U. S. Catholic Historical Society, p. 440, December, 1904) by Thomas F. Meehan, that the "black beech tree" (*Fagus sylvatica* var. *purpurea*?) was first introduced into America through Parmentier's Garden. Here were grown 396 kinds of ornamental and forest trees and ornamental shrubs.

Established by André Parmentier.

BUFFALO (1)

BUFFALO BOTANIC GARDEN
(SOUTH PARK BOTANIC GARDEN)
Lackawanna, New York

Established: 1894. *Area:* 155 acres.

Directors:

1. John F. Cowell (1894–1915)
2. Henry Elbers (1915–1919)
3. Leo Elbers (1919–1922)
4. John Grezinger (Feb. 1922–May 1922)
5. Charles Bartholomy (1922–1926)
6. Patrick W. Scanlon (1926–)

Serves as a public park. Open free, daily, at all hours. *Source of income:* Annual appropriations by the City of Buffalo. *Library:* In 1915 the library and the herbarium were transferred to the Buffalo Museum of Science. *Herbarium:* 100,000 specimens. *Plantations:* Systematic. *Arboretum* (500 species), *Fruticetum* (700 species). *Museum:* Open free, daily, from 9 a.m. to 5 p.m. *Affiliation:* The first director was professor of forestry in the University of Buffalo.

BUFFALO (2)

BOTANIC GARDEN OF BUFFALO CITY HOSPITAL
462 Grider Street. Seed List

CORNWALL-ON-THE-HUDSON

THE BLACK ROCK FOREST

Established: 1927. *Area:* 3137.68 acres.

Director: Henry Harrington Tryon (1927—)

“A private holding organized and equipped as a forest laboratory for detailed, intensive research work in problems of fundamental and applied Silviculture, Forest Management and Mensuration, Tree Nutrition, and Site Evaluation.” *Source of income:* Expenses are met in part by the owner, in part by the sale of forest products. *Open free daily;* campfires and automobiles are prohibited. *Publications:* The Black Rock Forest Bulletins (established 1930, usually annually). The Black Rock Forest Papers (established 1935, usually semiannually).

FLUSHING

LINNAEAN BOTANIC GARDEN (Discontinued)

Established: 1737. *Area:* At first 8 acres; later, 80 acres.

Proprietors: Robert Prince (1737—); William Prince (?); William Robert Prince (?–1869).

Note: This garden was primarily a nursery. The name “Linnaean Botanic Garden” was not given it until 1793. The garden, from its beginning to its end, was for 130 years conducted by one family—through five generations. Here, it is said, were planted the first tulips, the first Lombardy poplars, and the first Mahonia in America. This appears to have been the first “botanic garden” on Long Island. Discontinued about 1870.

GILBOA

(FOSSIL PLANT BOTANIC GARDEN)

The Director, State Museum, Albany, New York

Established: 1927. *Area:* 80 sq. ft.

Gilboa Fossil Trees. This is a roadside exhibit of specimens of fossil tree stumps near the spot where they were taken from the rocks at Gilboa, in the Catskill Mountains, Schoharie County, New York State. The group is just within a fence and can be plainly seen from passing automobiles. A large-lettered label can easily be read from a car standing in the road. The stumps

are set in a cement base thick enough to be unaffected by the action of frost. The fossil forests of Gilboa are of Upper Devonian age.

This exhibit was installed by the New York State Museum (Albany, N. Y.) through the cooperation of the New York City Board of Water Supply in the spring of 1927. According to a statement of the Museum, "These Gilboa trees in general must have resembled the tree ferns of the tropics today, and also of the ancient Carboniferous and Upper Devonian Times. They do not, however, belong to this group, but were higher types—seed ferns [Pteridosperms]."

"The greatest interest in these forests is that they are the oldest known to science." (*See Lester Park; Saratoga Springs.*)

ITHACA

CORNELL UNIVERSITY ARBORETUM

Cornell University

Established: 1934. *Area:* 500 acres.

Directors: Under the direction of an arboretum committee of the faculty.

Serves as a public park. Open free, daily. *Source of income:* The initial planting was done by CCC (Civilian Conservation Corps, of the National Recovery Administration—NRA) men in 1935. The cost of maintenance is met by annual appropriations to Cornell University. *Herbarium and Museum:* As of 1935 no steps had been taken toward the development of a herbarium and museum apart from those already in existence at the University. During 1936 "much planting was done."

LACKAWANNA (SEE BUFFALO (1))

LESTER PARK (NEAR SARATOGA SPRINGS)

FOSSIL BOTANIC GARDEN

New York State Department of Conservation, Albany

In 1914 the New York State Museum received from Willard Lester, Esq., a deed of gift of about 3 acres of land in the township of Greenfield, two miles west of Saratoga Springs, N. Y. This area includes the widely known "*Cryptozoon Ledge*," and

is set apart as a public park to be preserved and protected by the State because of its paleobotanical interest. A notice of this gift, and a brief geological and paleobotanical description of the area was given by Dr. John M. Clarke, Director of the New York State Museum, in *Science* 40: 884. 18 D 1914, under the title, "A fossil botanical garden." On January 1, 1927, Lester Park was transferred from the State Museum to the Department of Conservation, in connection with the reorganization of the New York State government. (See also *Gilboa*, p. 385; *Saratoga Springs*, p. 390.)

NEW YORK CITY (1)

ELGIN BOTANIC GARDEN (DISCONTINUED)

Established: 1801, by Dr. David Hosack. *Area*: 20 acres.

This Garden was established "as a repository of native plants, and as subservient to medicine, agriculture, and the arts." The land was purchased by Hosack from "the Corporation of the City of New York," for \$4,807.36, and in the first edition of his "Catalog of Plants Contained in the Botanic Garden at Elgin" (New York, 1806), he reports that the greater part of the area was then in cultivation. He states further that "A primary object of attention in this establishment will be to collect and cultivate the native plants of this country, especially such as possess medicinal properties, or are otherwise useful." Also to introduce similar kinds of plants from different parts of the world to ascertain which ones might be successfully naturalized. The plantations were in part systematic illustrating the "natural orders" according to both Linnaeus and Jussieu.

On January 3, 1811 Hosack conveyed the Botanic Garden with its conservatory and all other appurtenances to the State of New York for the sum of \$74,268.75. The plants and tools were, in 1810, appraised by a Committee that included the botanist Pursh, as worth \$12,635.74½ cents. The Regents of the State placed the Garden in the control of the College of Physicians and Surgeons. When this college became part of Columbia University (1814) the University took over the ownership and management. Subsequently 16 city lots at 48th St. and Fifth Ave. were sold to the Collegiate Dutch Reformed Church for \$80,000 and about 1900

the block between 47th and 48th Sts. was sold for about \$3,000,000. The Garden became neglected for lack of funds and was gradually given up. The land between 48th and 51st Streets, from Fifth to Sixth Avenue was leased in 1929 to John D. Rockefeller, Jr., at a rental of \$3,000,000 a year, and is now the site of Rockefeller Center. Of 513,575 sq. ft. (nearly 12 acres) of the area of the Rockefeller Center, 445,600 sq. ft. were in the area of the Elgin Botanic Garden. "Gardens of the Nations," illustrating types of gardens characteristic of different countries, are now (1938) maintained on the roof of the central building of Rockefeller Center.

NEW YORK CITY (2)

THE NEW YORK BOTANICAL GARDEN

Fordham Branch P. O., New York, N. Y.

Established: 1895 (Chartered, April, 1891). *Area:* 260 acres.

Directors:

1. Nathaniel Lord Britton (1895–1929)
2. Elmer Drew Merrill (1930–1935)
3. Marshall Avery Howe (1935–1936)
4. Henry Allan Gleason (Acting) (1936–1938)
5. William Jacob Robbins (1938–)

Serves as a public park. Open free every day in the year.
Sources of income: Endowment, annual appropriations by the City of New York, private subscriptions, membership dues.

Membership: Eight (8) classes, as follows:

Benefactor	single contribution	\$25,000
Patron	single contribution	5,000
Fellow for Life	single contribution	1,000
Member for Life	single contribution	250
Fellowship Member	annual fee	100
Sustaining Member	annual fee	25
Annual Member	annual fee	10
Garden Club Membership ..	annual fee	25

Library: Reference. 46,000 volumes and many thousand pamphlets. Current periodicals received: Approximately 1000. *Herbarium:* More than 1,900,000 specimens from all parts of the world, illustrating the entire plant kingdom. Important collection of more than 7000 fossil plants. *Plantations:* Extensive collec-

tions of hardy and ornamental plants with large *Arboretum*, *Fruticetum* and natural hemlock forest, Thompson Memorial Rock Garden, Rose Garden, water-lily pools, Perennial Border and Annual Borders, displaying in season many varieties of plants. Large greenhouses with comprehensive display of tropical plants, flower shows throughout winter and spring.

Publications:

Journal. Established 1900. Monthly. \$1.00 a year.

Mycologia. Established 1909. Bi-monthly. Subscription \$6.00 a year.

North American Flora. Established 1907. Issued in parts at irregular intervals. Planned to be complete in 34 volumes. 86 parts now issued (July, 1938). Sold only by subscription.

Addisonia. Established 1916. Semi-annual. Devoted to colored plates and descriptions. Subscription \$10.00 a volume (2 years).

Brittonia. Established 1931. Issued irregularly. Subscription, \$5.00 a volume.

Memoirs. Established 1900. Issued irregularly. Subscription to members of the Garden \$1.50 a volume; to others \$3.00.

Seed Exchange List. Annually.

Museum: Open free, daily, from 10 a.m. to 4:30 p.m. *Lectures:* Special lectures are given to school children at the garden, but not at schools. *Education:* School for professional gardeners, classes in botany and practical gardening; docentry for classes from the public schools and groups of adults. Free public lectures throughout the year. *Affiliation:* Columbia University.

PORTAGEVILLE

LETCHWORTH PARK ARBORETUM

Established: Park, 1907. Arboretum, 1912. *Area:* About 1000 acres.

Director (Advisor): George B. Sudworth (1912-1927).

Occupies a strip of land extending for three miles along both banks of the Genesee River, given to the State of New York in 1907 by William Pryor Letchworth. A museum and library building was erected in 1912-1913. "The object in establishing the Arboretum was primarily to promote the study of tree growth under varying conditions of soil temperature, exposure, etc. Also

to serve in helping to educate the public to the great importance of forestry work."

POUGHKEEPSIE

DUTCHESS COUNTY BOTANICAL GARDEN

Established: 1920. *Area:* 4 acres.

Director: Edith Adelaide Roberts (1920—).

Open free to the public. *Plantations:* Ecological. Popularly known as the "Dutchess County Ecological Laboratory." The majority of the native plants of Dutchess County are grown here in some 28 ecological associations (out of a total of 30 in Dutchess County). *Source of income (in part):* In 1922-1923 the Department of Botany was granted the income from the Elizabeth Drinker Storer Fund for seven years. *Affiliation:* Vassar College.

SARATOGA SPRINGS

PETRIFIED SEA GARDENS

(Formerly called Ritchie Park)

Route 29, West of Saratoga Springs

Established: 1933. *Area:* 30 acres.

Note: About one-half mile south of Lester Park on the Greenfield road, privately owned by Mr. Robert R. Ritchie, Saratoga Springs, New York. This entire area is all underlain by "Cryptozoon reefs," formed by three different species of this calcareous alga. The display is said to be finer than the ledge in Lester Park. More than six acres have been cleared so as to display the fossil remains. "The finest thing of the kind in the world."

Open to the public; admission 35 cents. Guides. A natural limestone ledge, 500 feet long, has been developed as a rock garden. Lily pools. "Our future project includes conservation of the natural beauty of the park, testing plant material for hardiness, and a 'bird haven.'" (See also *Lester Park* and *Gilboa*.)

YONKERS

BOYCE THOMPSON INSTITUTE ARBORETUM

1086 North Broadway

Established: 1925. *Area:* 300 acres.

Director: William Crocker (1925—).

Admission only by permit. *Publications by the Institute:* Contributions (1925); Professional Papers (1925); Reprints.

North Carolina

CHAPEL HILL

THE COKER ARBORETUM

Established: 1902. *Area:* 5 acres. There is also a greenhouse and propagation ground of about 2 acres at another place on the campus.

Director: William Chambers Coker (1902–).

Serves as a public park. Open free daily. *Source of income:* University of North Carolina. The Arboretum is administered as part of the Department of Botany of the University. *Library:* That of the University. *Herbarium:* Largest in the South. About 74,000 sheets. *Medicinal Plant Garden.*

HICKORY

THE HICKORY ARBORETUM

G. F. Ivey, Hickory, North Carolina

Established: 1933. *Area:* 9 acres.

Director: G. F. Ivey (1933–).

Serves as a public park. Open free daily. *Source of income:* Private funds. *Plantations:* Not definitely classified.

Ohio

CINCINNATI (1)

MT. AIRY FOREST ARBORETUM

c/o Board of Park Commissioners, 2005 Gilbert Avenue

Established: 1931. *Area:* 1304 acres.

Director: Under control of Cincinnati Board of Park Commissioners.

The Arboretum is a part of the public park. Open free daily. *Source of income:* General Park appropriations and private donations. *Plantations:* Systematic.

CINCINNATI (INDIAN HILL) (2)

STANLEY M. ROWE ARBORETUM

R. R. No. 1, Station " M "

Established: 1929. *Area:* 100 acres.

This Arboretum is a private estate. It does not serve as a public park, but is open free at any time to those interested. *Source of income:* Private funds. *Library:* Small. *Fruticetum:* Shrubs not segregated.

CLEVELAND

THE HOLDEN ARBORETUM

The Cleveland Museum of Natural History, 2717 Euclid Avenue

Established: December, 1930. *Area:* 100 acres.*Directors:* Under supervision of the Museum.

Source of income: None at present. Future income from memorial fund. There have been a few private gifts. *Library:* 10,000 specimens. *Publication:* "Significance of the Holden Arboretum."

COLUMBUS

BOTANIC GARDEN OF THE OHIO STATE UNIVERSITY

Department of Botany, The University

Established: 1930. *Area:* 12 acres.*Director:* Edgar Nelson Transeau (1930—).

Source of income: University funds. *Herbarium* (of the Department of Botany of the University): 65,000 specimens. *Plantations:* Demonstration, experimental, and plant breeding plots.

NEWARK

DAWES ARBORETUM

Established: June, 1919, by Beman G. Dawes. *Area:* 350 acres.

In Licking County near Newark.

Source of income: Endowment. *Note:* "Outstanding figures of government, industry, military, and sport circles have planted some of the Arboretum's 800 trees, which represent all the varieties that thrive in the temperate zone, including descendants of such famous and historical trees as the Charter Oak and the Logan Elm."

OBERLIN

OBERLIN COLLEGE ARBORETUM

Established: 1914. *Area:* 95 acres.

Charles M. Hall (deceased 1914) bequeathed to the College the land and an endowment fund.

TOLEDO

The Director, Toledo Zoological Society, Walbridge Park

Note: In the Museum News, April 15, 1936, it is reported that the Toledo Zoological Society has under construction a natural science development, comprising a Museum of Natural and Social Science, and a *Botanic Garden with conservatories*. Our letter of inquiry with questionnaire remains unanswered.

WOOSTER

WOOSTER ARBORETUM

Established: 1908. *Area:* 70 acres.

Administered by Ohio Agricultural Experiment Station, Division of Forestry.

Serves as a public park. Open free, daily. *Library.*

Oklahoma (See page 406)

Oregon

PORTLAND (1)

HOYT PARK ARBORETUM

Established: 1928. *Area:* 140 acres.

Director: C. P. Keyser, Superintendent of Parks.

Open free daily. *Source of income:* Taxes. Established by the City Council through the influence of the Committee on Forestry of the Chamber of Commerce of Portland.

PORTLAND (2)

WIND RIVER ARBORETUM

See Carson, Washington

Pennsylvania

BETHLEHEM

ARBORETUM OF LEHIGH UNIVERSITY

Established: 1916. *Area:* 11 acres.

Directors: 1. H. S. Drinker (1916–1922); 2. N. M. Emery (1922–1929); 3. A. Litzenberger (Superintendent) (1929–).

Open free, by appointment, 9 a.m.–4 p.m. *Source of income:* Budget of Lehigh University. *Plantations:* Geographic.

HAVERFORD

HAVERFORD COLLEGE ARBORETUM

Established: 1833. *Area:* 212 acres.

Open free daily. *Source of income:* The College. *Publication:* Report of Campus Club.

MARSHALLTON

MARSHALLTON ARBORETUM (DISCONTINUED)

In 1773 Humphrey Marshall, cousin of John Bartram, began the foundation of an Arboretum in Marshallton (then called Bradford), Penn. (See Philadelphia: Bartram's Garden, p. 395.)

MEDIA

PAINTERS' ARBORETUM (DISCONTINUED)

Established: About 1825. Discontinued "sometime in the 'seventies." *Area:* About 4 acres.

Location: Middletown Township, Delaware County, Pennsylvania—three miles from Media.

Founders: Jacob and Minshall Painter (brothers).

Note: H. S. Connard (Proc. Delaware County Institute of Science 7: No. 1. 1–14. May, 1914) stated that as late as 1898 the site of this Garden contained "one of the richest and rarest collections of trees and shrubs in this vicinity." He gives a partial list of them (as of 1898), comprising eighty genera and about 117 species, including the Cutter-dock (*Petasites*), *Sequoia gigantea*, Cedar of Lebanon, and *Gordonia* (*Franklinia*). A description of the ecology of this area is given by T. Chalkley Palmer

in *The Westonian*, Vol. 30, No. 4, Autumn, 1929. In this article Mr. Palmer records the fact that this area, part of a tract of some 800 acres or more, was, in 1929, in the ownership of Mr. John J. Tyler, of Germantown (Philadelphia), a nephew of the Painter brothers. As of 1936 Mr. Gerard Ronon, of Philadelphia, was Trustee of the property. Our questionnaire was not returned.

MERION

ARBORETUM OF THE BARNES FOUNDATION

Merion, Montgomery Co.

Established: 1923. *Area*: 11 acres.

Director: Mrs. A. C. Barnes (1923—).

Admission on request, free. *Source of income*: Barnes Foundation. See article by Frank A. Schrepfer, *The Arboretum of the Barnes Foundation*. (*Landscape Architecture* 25: 21-26. Oct. 1935.) *Library*: 225 volumes. *Plantations*: Systematic and horticultural. *Lectures to school children* from time to time.

PHILADELPHIA

AWBURY ARBORETUM

Germantown, Philadelphia

Established: 1918. *Area*: 65 acres.

Directors: Arthur W. Cowell (1919-1935); Howard S. Kneedler, Jr. (1935—).

Serves as a public park. Open free, daily, from sunrise to sunset. *Source of income*: Endowment fund and subscriptions. *Fruticetum*: Shrubs not segregated.

BARTRAM'S GARDEN

Founded 1728 (some writers give 1731), by John Bartram, on the banks of the Schuylkill River, at what is now 54th St. and Eastwick Ave., Philadelphia. Often referred to as the first botanic garden in the Colonies. It was continued by William Bartram, son of John, after the latter's death, but discontinued and abandoned about the end of the 18th century. In 1891 the site was acquired by the City of Philadelphia, and in 1923 was placed under the Fairmount Park Commission to be administered as a historic

monument. It is a special interest of the John Bartram Association, a private organization.

Present area: 36 acres. Bartram's original garden about 8 acres.

Open free daily. Several trees still standing are believed to have been planted by John Bartram, including a *Ginkgo biloba*, considered by Harshberger as the first Ginkgo to be planted in America, since it is larger than the one in Woodland Cemetery (Philadelphia) which Charles S. Sargent considered the oldest.

BOTANIC GARDEN OF THE UNIVERSITY OF PENNSYLVANIA
University of Pennsylvania, Philadelphia

Established: 1892. *Area:* Over 4 acres.

Directors: John Muirhead Macfarlane (1895–1920); Rodney Howard True (1920–July 1, 1937); Jacob Richard Schramm (July 1, 1937–).

Open free to the public daily from 8 a.m. to 5 p.m. *Source of income:* Endowment of \$55,000, and annual University grant. *Library:* More than 10,300 volumes, 20,000 pamphlets (as of 1938). *Herbarium:* More than 200,000 sheets. *Plantations:* Systematic and general. Supplies about 10,000 specimens annually to local schools for study.

DARLINGTON'S ARBORETUM (DISCONTINUED)

Established: About 1850. Laid out as part of the public park of Westchester, Pennsylvania, by William Darlington.

EVANS'S ARBORETUM (DISCONTINUED)

Established: 1828, near Bryn Mawr by John Evans.

HEMLOCK ARBORETUM

Care of Charles F. Jenkins, Mt. Airy, Philadelphia, Pa.

Established: 1931. *Area:* 5½ acres.

Director (and owner): Charles F. Jenkins.

Does not serve as a public park, but is open free to the public. *Source of income:* Privately endowed. *Library:* Small. *Plantations:* Systematic and geographic. Now contains over 150 specimens of Tsugas, including nine species and over forty varieties. *Publications:* Quarterly Bulletin. (Jan., April, July and Oct.)

MARSHALL'S GARDEN (DISCONTINUED)

Established: 1773, at West Bradford, Pennsylvania, by Humphry Marshall, a cousin of John Bartram. Some of the trees are still standing (1937) but the garden, as such, has been abandoned. (See Philadelphia: Bartram's Garden, p. 395.)

MORRIS ARBORETUM OF THE UNIVERSITY OF PENNSYLVANIA
Chestnut Hill, Philadelphia

Established: Oct., 1932. *Area:* 160 acres.

Director: Rodney Howard True (1932—).

Does not serve as a public park. Admission free. Hours: 1–5 Wednesdays, Thursdays, and Saturdays. *Source of income:* Endowment (The Morris Foundation). *Library:* 1800 volumes; 400 pamphlets. *Herbarium:* 20,000 sheets. *Research Laboratories* equipped for study of Tree Diseases, Cytology and Genetics, Taxonomy of woody plants. *Fruticetum:* Shrubs not segregated. *Plantations:* Mainly systematic with attention to soil diversity. *Publications:* Quarterly *Bulletin* of Associates, illustrated (in 3rd year). Scientific monograph series, Vol. I. Conway Zirkle, *Beginnings of Plant Hybridization*. 1935. *Lectures* on horticultural subjects free to the public. *Study material* supplied to schools in limited quantity. *Affiliated* with University of Pennsylvania.

There are a number of graduate fellowships for students in botany working for advanced degrees. A stipend of \$1200 accompanies each appointment.

The property comprises two estates: "Compton" (about 90 acres), at Germantown and Hillcrest Avenues, Chestnut Hill (Philadelphia), and "Bloomfield" (70 acres), in Montgomery County, across the City line from "Compton."

ROSICRUCIAN GARDEN (DISCONTINUED ABOUT 1800)

Located on the lower Wissahickon River, previous to the American Revolution (early 18th Century). Contained medicinal herbs used by the Rosicrucian (Red Cross) fraternity.

WITT'S BOTANIC GARDEN (DISCONTINUED)

Established: 1708, by Christopher Witt at Germantown, now a suburb of Philadelphia.

READING

BOTANICAL GARDEN OF THE READING PUBLIC MUSEUM AND
ART GALLERY

Established: 1926. *Area:* 29 acres, on Wyomissing River.

Director: Levi Walter Mengel (1926—).

Serves as a public park. Open free daily, daylight to dark. *Source of income:* Budget of Reading School District. *Library:* 500 volumes. *Herbarium:* About 6000 specimens, chiefly plants of Eastern United States. *Plantations:* Systematic, geographic, economic, "Bird paradise," with feeding stations. *Greenhouse* of economic plants for school classes. *Museum:* Free daily, 10 a.m.—5 p.m.; Sundays, 2–5 p.m. Special lectures to school children.

SELINGSGROVE

BOTANIC GARDEN OF SUSQUEHANNA UNIVERSITY

Announcement was made by letter of Feb. 11, 1921, that a Botanic Garden was about to be established at Susquehanna University. No reply to our questionnaire of 1938.

SWARTHMORE

ARTHUR HOYT SCOTT HORTICULTURAL FOUNDATION
Swarthmore College

Established: 1929. *Area:* 250 acres.

Director: John Caspar Wister (1930—).

Serves as a public park. Open free at all times. *Source of income:* Endowment, Arthur Hoyt Scott Horticultural Foundation. *Library:* The botanical and horticultural books in the College Library. *Herbarium:* That of the Botanical Department of the College. *Fruticetum,* but shrubs not segregated. *Plantations:* Systematic and geographic. *Publications:* A preliminary report and occasional small pamphlets about flowering plants. *Affiliation:* The Garden is affiliated with Swarthmore College, Swarthmore, Pa. The chief emphasis of the Scott Foundation is upon collections of living plants suitable for outdoor culture by the average gardener in the climate of this area.

TYLER ARBORETUM (PAINTERS' ARBORETUM)

(See Media)

WESTTOWN

WESTTOWN SCHOOL ARBORETUM

Westtown

Established: 1906. *Area:* 20 acres.

Directors: Alfred Z. Haines (1906–1909); Albert L. Baily, Jr. (1921–).

Open free daily. *Source of income:* Donations. *Library:* The School library consists of about 200 volumes on botany. *Herbarium:* Approximately 3000 specimens. *The Arboretum* is restricted to “arborescent natural species.” There is no fruticetum. *Plantations:* Systematic. Shrubs and horticultural varieties of trees, while present in some numbers, are not the main interest of the project. This on account of limited area and funds. Conifers about 140 (including 27 species of *Pinus*). Deciduous trees, about 350. *Publications:* None. There is no scientific nor special educational program beyond the elementary botany courses of the Westtown (preparatory) School.

South Carolina

BROOKGREEN

BROOKGREEN GARDENS INCORPORATED

New York Office: 1 East 89th St.

Established (Incorporated): July 13, 1931. *Area:* Total, 4000 acres; Formal Garden, about 44 acres.

Director (Horticulturist in charge): Frank G. Tarbox, Jr.

Open free daily, 9 a.m. to 5:30 p.m.

This Garden is situated along the Waccamaw River, Georgetown County, near Charleston, S. C., between the River and State highway route 17. It is described as “a free public museum of natural history,” for the preservation of the flora and fauna of the southeast. It is privately owned, and administered by a board of seven Trustees, of which Mr. Archer M. Huntington is president. It has an endowment of over one million dollars. The original planting was done about 1800 or earlier by Joshua Ward, of Charleston. In 1932 curved cement walks were constructed to represent the wings of a butterfly. Within these curves are the plants, labeled with names and blooming seasons. “They may be considered as floral open-air museum cases, just as the whole garden within the

walls must be treated as an open-air museum of native plants of the southeast and of the history of American sculpture." At first the garden was intended to contain the sculpture of Anna Hyatt Huntington. It now contains a Museum of Small Sculpture (bronzes), in addition to the sculpture (by American sculptors) outdoors. There is a small zoological station near the entrance to the Gardens, and the grounds serve as a bird sanctuary. *Publications*: Catalogs and illustrated folders. The Brookgreen post office is now (1938) located in the old residence on the grounds.

CHARLESTON

THOMAS WALTER'S BOTANICAL GARDEN (DISCONTINUED)

Established by Thomas Walter in the second half of the 18th century on the banks of the Santee River, north of Charleston. Upon his death the Garden was abandoned; nothing remains now except Walter's grave, marked by a broken marble slab. Walter was the author of *Flora Caroliniana* (1788). Dr. John K. Small refers to this publication as "the first manual of the plants of a more or less definite geographic area," and to the Garden as "the first . . . in the southeastern corner of the American colonies." (Small, John Kunkel. *Manual of the Southeastern Flora*. ix. 1933; *Jour. N. Y. Bot. Jour.* 36: 166-167. 1935.)

COLUMBIA

UNIVERSITY OF SOUTH CAROLINA ARBORETUM

Established: 1938. *Area*: About 6 acres.

Director: Edward Caleb Coker (1938-).

Open free daily, 9 a.m. to 7 p.m. *Source of income*: Budget of the University of South Carolina. *Plantations*: Confined to native trees, shrubs, and herbaceous plants of South Carolina. A Prospectus was issued in 1936 and, about the same time, an undated folder in which it is pointed out that while the gardens at Brookgreen (q.v.) give the coastal regions their arboretum, the gardens in Columbia "will have a growth range that extends from the mountains of North Carolina to the deltas of the Mississippi."

Tennessee

KNOXVILLE

A. F. SANFORD ARBORETUM

P. O. Box 197

Established: 1930. *Area:* 20 acres.

Open free daily. *Source of income:* Maintained by owner personally. *Plantations:* Systematic. *Publications:* Occasional catalogues and planting list. *Affiliations:* University of Tennessee botanical department cooperates unofficially.

MADISON

MADISON COLLEGE ARBORETUM

Established: 1930. *Area:* 80 acres.*Director:* Floyd Bralliar (1930—).

Serves as a "semi-public park." Open free at all times. *Source of income:* Budget of Madison College. *Herbarium:* A nucleus of one now being started. *Plantations:* Systematic. *Affiliation:* Madison College (formerly Nashville Agricultural Normal Institute) is owned and operated by Nashville Agricultural Normal Institute Incorporated.

Texas

AUSTIN

BOTANIC GARDEN OF THE UNIVERSITY

A tract of land of 500 acres on the Colorado River near Austin belonging to the University was set aside to be developed in whole or part, as a botanic garden. "Activities nil for past seven or eight years." (*Fide* personal letters.)

FORT WORTH

FORT WORTH BOTANIC GARDEN

c/o Fort Worth Park Department, Rotary Park

Established: 1933. *Area:* 35 acres.*Directors:* Board of Park Commissioners.

Open free at all times. *Source of income:* The City refunds taxes on Park properties for up-keep. *Plantations* include Arbo-

retum, Water Gardens, Rose Garden, Arid and Native Wild Flower Gardens, and Nature Trails. *Library*: In the making (about 500 volumes and pamphlets in 1935). *Herbarium*: 8500 specimens mounted and classified. A large part of the Garden, just a little more than one year old (a Government Project), was built by relief labor. *Special lectures* are given to school children at the Garden. *Living material* is supplied to local schools for study. The Garden operates the Fort Worth Garden Center in the Horticultural Building. *Affiliation*: Fort Worth Public Schools; Fort Worth Garden Club.

HOUSTON

HOUSTON BOTANICAL GARDEN

Established: 1925. *Area*: 15 acres.

Administered by City Park Department. Open free, daily. *Museum* open daily except Monday. *Herbarium*: About 4000 sheets.

Washington

CARSON

WIND RIVER ARBORETUM

424 U. S. Court House, Portland, Oregon

Established: 1912. *Area*: 9 acres.

Administered by U. S. Department of Agriculture, Forest Service, Project of Pacific Northwest Forest and Range Experiment Station, ten miles northwest of Carson and 70 miles from Portland, Oregon, in Columbia National Forest. *Plantations*: About 2000 trees, over 150 species of Coniferae. *Publication*: Reports of Progress (mimeographed) 1932, 1937. The Arboretum was established under the direction of the District Forester; the field officer chiefly responsible for it until 1924 was Dr. J. V. Hofmann. It has since been administered by the Pacific Northwest Forest and Range Experiment Station of which Mr. Thornton T. Munger has been Director since 1924.

SEATTLE (1)

MEDICINAL PLANT GARDEN

College of Pharmacy, University of Washington

Established: 1910. *Area*: Approximately 5 acres.

Directors:

1. A. H. Dewey (1910-1912)

2. Earl Platt (1913–1914)
3. Arthur W. Linton (1914–1920)
4. James Thomson (1920–Nov. 1922)
5. Ludwig Metzger (1922–)

Open free daily to the public. *Source of income*: State appropriations. *Library*: 75 volumes. *Plantations*: Systematic, economic. *Publication*: Seed List. *Living material for study* supplied to schools on request.

SEATTLE (2)

WASHINGTON ARBORETUM AND BOTANICAL GARDEN

Department of Forestry, University of Washington

Established: December 16, 1935. *Area*: 260 acres.

Director: Hugo Winkenwerder (1935–).

Serves as a public park. In 1935 the area, Washington Park, adjacent to the Campus of the State University of Washington, was set aside as a botanic garden and arboretum by the Seattle Park Board. It is to be "a state-wide institution under perpetual supervision of the University of Washington.

Source of income: On December 16, 1935, a WPA (U. S. Works Progress Administration) Project, jointly sponsored by the University of Washington and the Park Department of the City of Seattle, was put into operation. This provides for \$166,629 of Federal Funds, and \$129,660 additional in services and materials contributed by the University and the City. This project was closed July 8, 1936, because the funds allotted were exhausted.

The Arboretum Foundation, "a non-profit corporation," has been formed "to assist in and foster the development of Washington's Arboretum and Botanical Garden." Membership in the Foundation is in five classes, as follows:

Associate	Annual dues	\$ 2.00
Regular	" "	5.00
Active	" "	10.00
Sustaining	" "	25.00
Patron	One payment of	\$500.00 or more

Plantations: Systematic; Ecological; Special.

Publications: The Arboretum Bulletin. Vol. I, No. 1, December, 1936. Seed List.

"By June 30, 1938, there will have been expended in development a sum slightly exceeding one million dollars. The work has been carried on largely through WPA projects with contributions from the sponsors, the University and the City of Seattle, and a number of gifts. . . . Two greenhouses and a nursery of nine acres are in full operation. . . . Some 2500 species and varieties of trees, shrubs, and herbs, and half a million bulbs have been planted." (Letter of April 15, 1938, from the Director.)

West Virginia

WHEELING

OGLEBAY ARBORETUM

Oglebay Park

Established: 1938. *Area:* 100 acres.

Director: A. B. Brooks (Park Naturalist), (1938—).

Note: This Park was originally called Waddington Farm. The planting of the Arboretum was begun during the spring of 1938.

Wisconsin

MADISON (1)

UNIVERSITY OF WISCONSIN ARBORETUM AND WILD LIFE REFUGE

Established: April, 1932. *Area:* 900 acres.

Executive Director: G. Wm. Longenecker (1932—).

Serves as a public park only in very small part. Admission free. *Source of income:* Gifts. Also appropriations from the State. *Library:* University Library. *Herbarium:* University Herbarium (approximately 120,000 specimens). *Plantations:* Systematic, geographic, ecologic. Some acreage has been set aside for Family, Genus, and Species groupings, but most of the plantings will be in the nature of natural groupings. Some of the ecological types being preserved and established are: Balsam, Black Spruce; Hard Maple, Beech; Hemlock Ravine; Jack Pine; Juniper Hillside; Wisconsin Oak Woods; Marsh; Wisconsin Prairies, Prairie Margin; Red Pine, White Pine; Tamarack Bog;

Aquatic Garden; etc. *Lectures* are given to school children at the Garden. *Note:* In the development of the Arboretum natural surfaces are being left undisturbed, except in some places where it is absolutely necessary to change them for service or safety. An item in *Science* for March 5, 1937, p. 236, states that the Alumni Research Foundation has allotted \$8000 which will provide for the continuation of the work now being done by Professor Aldo Leopold on game management and land-waste problems in connection with the university arboretum.

"Fourteen acres of lagoons with controlled water levels for shore bird studies have been finished. The shores of these lagoons are made in the form of flat benches at different water levels. These benches were covered with different types and mixtures of materials such as peat, marl, sand, clay, and gravel.

"Three prairie nurseries have been planted in the prairie area and several acres have been seeded to prairie material by the seed spot method. Over fifty tons of prairie plants have been planted in the prairie area this past year.

"A series of game bird food plots were planted and observed again this year, in order to get first hand information regarding the food habits of upland game birds.

"Since the first of January, 1937, 56,300 trees and shrubs and 19,200 evergreens have been planted."

MADISON (2)

WISCONSIN PHARMACEUTICAL GARDEN

Department of Pharmacy, University of Wisconsin

Established: 1913. *Area:* 38 acres.

Director: Edward Kremers (1913–1935); W. O. Richtmann, In Charge (1937); Arthur H. Uhl (1938–).

Source of income: State appropriations. (None, 1932–1936; partially restored, 1937.) *Supplies study material* to local schools.

RIPON

BOTANIC GARDEN OF RIPON COLLEGE

Plans for the establishment of this Garden were announced in 1928. Dr. James F. Groves, of the Botany Department of the College, was chosen Director. Initial planting in the spring of 1928.

Uruguay**MONTEVIDEO**

JARDIN BOTÁNICO DEL PRADO

Avenida Reyes 1155 y 1179

This Garden is under the Municipal Park Department.

Established: 1908. *Area:* 15 hectares.*Directors:* 1. Carlos Racine (1908–1917); 2. Luis Guillot (1917–1924); 3. Wilhelm Gustav Herter (1924–).*Serves as a public park.* Open free at all times. *Source of income:* The city budget. *Library:* 3000 volumes. *Herbarium:* 6000 specimens. *Plantations:* Geographic, ecologic. *Arboretum* systematically arranged. *Publication:* Index Seminum Horti Montevidensis. *Museum* open free during working hours.**Venezuela****CARACAS**

JARDIN BOTÁNICO

Administered by the National Government.

Wales

See Great Britain

Windward Islands

See British West Indies

Yugoslavia (See Jugoslavia)

ADDENDUM**Oklahoma****TULSA**

“The 23-acre estate of Mr. and Mrs. White Phillips, at 2727 Rockford Road, Tulsa, Oklahoma, has been offered by the owners to the city as an art and Indian culture museum and botanical garden . . . to be administered by the city park board and to contain plants indigenous to the Southwest.” (*Museum News* 16: 1 and 3. Oct. 15, 1938.)

The Brooklyn Institute of Arts and Sciences

OFFICERS OF THE BOARD OF TRUSTEES

CHAIRMAN
EDWARD C. BLUM

FIRST VICE-PRESIDENT
WALTER H. CRITTENDEN

SECOND VICE-PRESIDENT
ADRIAN VAN SINDEREN

THIRD VICE-PRESIDENT
CHARLES PRATT

TREASURER
EDWIN P. MAYNARD

SECRETARY
FRANCIS T. CHRISTY

BOTANIC GARDEN GOVERNING COMMITTEE

MISS HILDA LOINES, *Chairman*

PHILIP A. BENSON

WALTER HAMMITT

EDWARD C. BLUM, *Ex officio*

WILLIAM T. HUNTER

MRS. WILLIAM H. CARY

DAVID H. LANMAN

WALTER H. CRITTENDEN

JAMES G. McDONALD, *Ex officio*

MRS. LEWIS W. FRANCIS

EDWIN P. MAYNARD

ALFRED E. MUDGE

EX OFFICIO MEMBERS OF THE BOARD

THE PRESIDENT, THE BROOKLYN INSTITUTE OF ARTS AND SCIENCES
JAMES G. McDONALD, LL.D.

THE FOLLOWING OFFICIALS OF THE CITY OF NEW YORK

THE MAYOR

THE COMPTROLLER

THE COMMISSIONER OF PARKS

GENERAL INFORMATION

MEMBERSHIP.—All persons who are interested in the objects and maintenance of the Brooklyn Botanic Garden are eligible to membership. Members enjoy special privileges. Annual Membership, \$10 yearly; Sustaining Membership, \$25 yearly; Life Membership, \$500. Full information concerning membership may be had by addressing *The Director, Brooklyn Botanic Garden, 1000 Washington Avenue, Brooklyn, N. Y.* Telephone, Prospect 9-6173.

THE BOTANIC GARDEN is open free to the public daily from 8 a.m. until dusk; on Sundays and Holidays it is open at 10 a.m.

ENTRANCES.—On Flatbush Avenue, near Empire Boulevard and near Mt. Prospect Reservoir; on Washington Avenue, south of Eastern Parkway and near Empire Boulevard; on Eastern Parkway, west of the Museum Building.

The street entrance to the Laboratory Building is at 1000 Washington Avenue, opposite Crown Street.

To ASSIST MEMBERS and others in studying the collections the services of a docent may be obtained. This service is free of charge to *members of the Botanic Garden*; to others there is a charge of 50 cents per person. Arrangements must be made by application to the Curator of Public Instruction at least one day in advance. No parties of less than six adults will be conducted.

To REACH THE GARDEN take Broadway (B.M.T.) Subway to Prospect Park Station; Interborough Subway to Eastern Parkway-Brooklyn Museum Station; Flatbush Avenue trolley to Empire Boulevard; Franklin Avenue, Lorimer Street, or Tompkins Avenue trolley to Washington Avenue; St. John's Place trolley to Sterling Place and Washington Avenue; Union Street or Vanderbilt Avenue trolley to Prospect Park Plaza and Union Street. By AUTOMOBILE from points on Long Island take Eastern Parkway west and turn left at Washington Avenue; from Manhattan, take Manhattan Bridge, follow Flatbush Avenue Extension and Flatbush Avenue to Eastern Parkway, turn left following Parkway to Washington Avenue; then turn right.

BROOKLYN BOTANIC GARDEN PUBLICATIONS

RECORD. Established, January, 1912. An administrative periodical issued quarterly (1912-1928); bimonthly (1929-1932); quarterly (1933-). Contains, among other things, the *Annual Report* of the director and heads of departments, special reports, announcements of courses of instruction, seed list, guides, miscellaneous papers, and notes concerning Garden progress and events. Free to members of the Garden. To others \$1.00 a year. Circulates in 59 countries.

MEMOIRS. Established, July, 1918. Published irregularly. Circulates in 47 countries.

Volume I. *Dedication Papers*: 33 scientific papers presented at the dedication of the laboratory building. 1917. 521 pages. \$3.50, plus postage.

Volume II. The vegetation of Long Island. Part I, The vegetation of Montauk: A study of grassland and forest. By Norman Taylor, June 11, 1923. 108 pages. \$1.00, plus postage.

Volume III. Vegetation of Mount Desert Island, Maine, and its environment. By Barrington Moore and Norman Taylor. 1927. 151 pages. \$1.60.

CONTRIBUTIONS. Established, 1911. Papers originally published in periodicals, reissued as "separates" without change of paging. 25 numbers constitute one volume. 25 cents each, \$5.00 a volume. Circulates in 34 countries.

No. 79. *The iris thrips and its control by hot water, with notes on other treatments.* 12 pages. 1937.

No. 80. *Inheritance of resistance to loose and covered smuts in Markton oat hybrids.* 17 pages. 1938.

No. 81. *Inheritance of resistance to loose and covered smuts in oat hybrids.* 10 pages. 1937.

No. 82. *Culture and inoculation studies on races of the loose and covered smuts of oats.* 13 pages. 1938.

No. 83. *Pteridophyta of the Galapagos and Cocos Islands.* 31 pages. 1938.

No. 84. *Influence of the growth of the host on oat smut development.* 24 pages. 1938.

LEAFLETS. Established, April 10, 1913. Published weekly or biweekly during April, May, June, September, and October. The purpose of the *Leaflets* is primarily to give announcements concerning flowering and other plant activities to be seen in the Garden near the date of issue, and to give popular, elementary information about plant life for teachers and others. Free to members of the Garden. To others, fifty cents a series. Single numbers 5 cents each. Circulates in 28 countries. Temporarily discontinued since 1936.

GUIDES to the collections, buildings, and grounds. Price based upon cost of publication. Issued as numbers of the *RECORD*; see above.

Guide No. 5. The Rock Garden. 28 illustrations. Price, 35 cents. By mail, 40 cents.

Guide No. 6. Japanese potted trees (Hachinoki). 11 illustrations. Price, 35 cents. By mail, 40 cents.

Guide No. 7. The story of our boulders: Glacial geology of the Brooklyn Botanic Garden. 22 illustrations. Price, 35 cents. By mail, 40 cents.

Guide No. 8. The story of fossil plants. 8 illustrations. Price, 35 cents. By mail, 40 cents.

SEED LIST. (*Delectus Seminum*) Established, December, 1914. Since 1925 issued each year in the January number of the *RECORD*. Circulation includes 160 botanic gardens and institutions located in 40 countries.

ECOLOGY. Established, January, 1920. Published quarterly in coöperation with the *ECOLOGICAL SOCIETY OF AMERICA*. Subscription, \$4.00 a year. Circulates in 48 countries.

GENETICS. Established, January, 1916. Bimonthly. Subscription, \$6.00 a year. Circulates in 37 countries.

BROOKLYN BOTANIC GARDEN RECORD

VOL. XXVII

OCTOBER, 1938

NO. 4

PROSPECTUS

OF COURSES, LECTURES, AND OTHER EDUCATIONAL
ADVANTAGES OFFERED TO MEMBERS AND TO
THE GENERAL PUBLIC

1938-1939

PUBLISHED QUARTERLY
AT PRINCE AND LEMON STS., LANCASTER, PA.
BY THE BROOKLYN INSTITUTE OF ARTS AND SCIENCES
BROOKLYN, N. Y.

Entered as second-class matter in the post-office at Lancaster, Pa., under act of August 24, 1912.

BROOKLYN BOTANIC GARDEN

Scientific, Educational, and Administrative Officers

SCIENTIFIC AND EDUCATIONAL

The Staff

C. STUART GAGER, Ph.D., Sc.D., Pd.D., *Director*
MONTAGUE FREE, Certificate, Royal Botanic Gardens, Kew, *Horticulturist*
ARTHUR HARMOUNT GRAVES, Ph.D., *Curator of Public Instruction*
ALFRED GUNDERSEN, Docteur de l'Université (Paris), *Curator of Plants*
WILLIAM E. JORDAN, B.S., *Librarian*
GEORGE M. REED, Ph.D., *Curator of Plant Pathology*
ELLEN EDDY SHAW, B.S., *Curator of Elementary Instruction*
HENRY K. SVENSON, Ph.D., *Curator of the Herbarium*
MARGARET M. DORWARD, A.B., *Assistant Curator of
Elementary Instruction*

Other Officers

MARY AVERILL, *Honorary Curator of Japanese Gardening and Floral Art*
HAROLD A. CAPARN, *Consulting Landscape Architect*

RALPH CURTISS BENEDICT, Ph.D., *Resident Investigator (Ferns)*
RALPH H. CHENEY, Sc.D., *Resident Investigator (Economic Plants)*

EMILIE PERPALL CHICHESTER, *Library Assistant*
CHARLES F. DONEY, M.S., *Assistant in Woody Plants*
WILLIAM H. DURKIN, *Curatorial Assistant*
ELSIE TWEMLOW HAMMOND, M.A., *Instructor*
D. ELIZABETH MARCY, A.M., Ph.D., *Research Assistant*
FRANCES M. MINER,* A.B., *Instructor*
MARGARET BURDICK PUTZ, *Curatorial Assistant*
HESTER M. RUSK, A.M., *Instructor*
MARGERY H. UDELL, *Curatorial Assistant*
L. GORDON UTTER, M.S., Ph.D., *Research Assistant*
HILDA VILKOMERSON, A.M., *Curatorial Assistant*

LOUIS BUHLE, *Photographer*
MAUD H. PURDY, *Artist*

ADMINISTRATIVE

DANIEL C. DOWNS, *Secretary and Accountant*
MAUDE E. VORIS, *Assistant Secretary*
NORMA STOFFEL BANTA, *Office Assistant*

MARIE-LOUISE HUBBARD, A.M., *Secretary to the Director*
GERTRUDE W. MERRILL,† A.B., *Field Secretary*
FRANK STOLL, *Registrar and Custodian*

HELEN E. BENNETT, *Stenographer*
LAURA M. BREWSTER, *Stenographer*
CONSTANCE PURVES ELSON, B.A., *Stenographer*

* On leave of absence, October 1, 1937, to October 1, 1938.

† Until July 31, 1938.

INFORMATION CONCERNING MEMBERSHIP

The Brooklyn Institute of Arts and Sciences is organized in three main departments: 1. The Department of Education. 2. The Museums. 3. The Botanic Garden.

Any of the following seven classes of membership may be taken out through the Botanic Garden:

1. Annual member	\$ 10
2. Sustaining member	25
3. Life member	500
4. Permanent member	2,500
5. Donor	10,000
6. Patron	25,000
7. Benefactor	100,000

Sustaining members are annual members with full privileges in Departments one to three. Membership in classes two to seven carries full privileges in Departments one to three.

In addition to opportunities afforded to members of the Botanic Garden for public service through cooperating in its development, and helping to further its aims to advance and diffuse a knowledge and love of plants, to help preserve our native wild flowers, and to afford additional and much needed educational advantages in Brooklyn and Greater New York, members may also enjoy the privileges indicated on the following page.

Further information concerning membership may be had by addressing The Director, Brooklyn Botanic Garden, Brooklyn, N. Y., or by personal conference by appointment. Telephone, Prospect 9-6173.

PRIVILEGES OF MEMBERSHIP

1. Free admission to the buildings and grounds at all times.
2. Cards of admission for self and friends to all exhibitions and openings preceding the admission of the general public, and to receptions.
3. Services of docent (by appointment), for self and party (of not less than six), when visiting the Garden.
4. Admission of member and one guest to field trips and other scientific meetings under Garden auspices, at the Garden or elsewhere.
5. Free tuition in most courses of instruction; in other courses a liberal discount from the fee charged to non-members.
6. Invitations for self and friends to spring and fall "Flower Days," and to the Annual Spring Inspection.
7. Copies of Garden publications, as follows:
 - a.* RECORD (including the ANNUAL REPORT).
 - b.* GUIDES (to the Plantations and Collections).
 - c.* LEAFLETS (of popular information).
 - d.* CONTRIBUTIONS (on request. Technical papers).
8. Announcement Cards (Post Card Bulletins) concerning plants in flower and other items of interest.
9. Privileges of the Library and of the Herbarium.
10. Expert advice on the choice and care of ornamental trees, shrubs, and herbaceous plants, indoors and out; on planting the home grounds; the care of lawns; and the treatment of plants affected by insect and fungus pests.
11. Determination of botanical specimens.
12. Participation in the periodical distribution of surplus plant material and seeds, in accordance with special announcements sent to members from time to time.
13. Membership privileges in other botanic gardens and museums outside of Greater New York, when visiting other cities, and on presentation of membership card in Brooklyn Botanic Garden. (See the following page.)

OUT-OF-TOWN MEMBERSHIP PRIVILEGES

In accordance with a cooperative arrangement with a number of other institutions and organizations, Brooklyn Botanic Garden members, when visiting other cities, may, on presentation of their Botanic Garden membership card at the office of the cooperating museum or organization, be accorded, without charge, the same privileges as are enjoyed by the members of that institution, including admission to exhibits and lectures, and invitation to social events. This does not include being enrolled on the mailing list for publications, and does not include free admission to the Philadelphia and Boston spring Flower Shows.

In reciprocation, the members of the cooperating units, when visiting the Metropolitan district of Greater New York, will be accorded full membership privileges at the Brooklyn Botanic Garden.

The cooperating units are as follows:

Academy of Natural Sciences, Philadelphia, Pa.
 Berkshire Museum, Springfield, Mass.
 Boston Society of Natural History, Boston, Mass.
 Buffalo Museum of Science, Buffalo, N. Y.
 California Academy of Sciences, San Francisco.
 Carnegie Museum, Pittsburgh, Pa.
 Charleston Museum, Charleston, S. C.
 Everhart Museum of Natural History, Science and Art, Scranton, Pa.
 Fairbanks Museum of Natural Science, St. Johnsbury, Vt.
 Field Museum of Natural History, Chicago, Ill.
 Los Angeles Museum, Los Angeles, Calif.
 Massachusetts Horticultural Society, Boston, Mass.
 Missouri Botanical Garden, St. Louis, Mo.
 Newark Museum, Newark, N. J.
 New York State Museum, Albany, N. Y.
 Peabody Museum of Archaeology and Ethnology, Cambridge, Mass.
 Pennsylvania Horticultural Society, Philadelphia, Pa.
 Philadelphia Commercial Museum, Philadelphia, Pa.
 Southwest Museum, Los Angeles, California.

REGULATIONS CONCERNING PHOTOGRAPHING, PAINTING, AND SKETCHING

1. No permit is required for photographing with a hand camera, or for sketching or painting without an easel on the Grounds or in the Conservatories.

2. Sketching and painting with an easel and the use of a camera with tripod are not allowed in the Japanese Garden, the Rose Garden, the Local Flora Section (Native Wild Flower Garden), nor the Conservatories at any time without a permit. No permits are given for use after 12 o'clock noon on Sundays and holidays.

3. Artists, and the public in general, may not bring into the Botanic Garden chairs, stools, or anything to sit in or on.

4. Holders of permits must not set up tripod cameras nor easels in such a way as to involve injury to living plants or lawns, nor to cause an obstruction to traffic on congested paths or walks.

5. Application for permits should be made at the office of the Director, Laboratory Building, Room 301, or by mail (1000 Washington Avenue), or by telephone (PRospect 9-6173).

BROOKLYN BOTANIC GARDEN RECORD

VOL. XXVII

OCTOBER, 1938

NO. 4

PROSPECTUS: 1938-1939

LIST OF COURSES OFFERED

	Date of First Meeting	Page
Fall Courses, 1938		
Wild Flowers and Ferns of the New York Region	Sept. 17	410
Evergreens: How to Know Them	Sept. 21	410
Ornamental Shrubs	Sept. 21	411
Fall Herbaceous Plants	Sept. 27	411
Trees and Shrubs in Winter	Oct. 1	410
Walks and Talks in the Botanic Garden	Oct. 4	411
Fall Nature Study and Gardening (for Children)	Oct. 15	417
Botany for Gardeners	Oct. 25	411
Plants in the Home: How to Grow Them	Nov. 2	410
Winter Courses, 1939		
Trips to the Tropics	Jan. 21	412
Winter Course (for Children)	Jan. 21	417
Spring Courses, 1939		
Spring Nature Study	Feb. 7	415
Spring Garden Work	Feb. 8	413
Spring Nature Study and Gardening (for Children)	March 4	417
Plant-Animal Links in the Chain of Life	March 8	413
Walks and Talks in the Botanic Garden	April 11	411
Ornamental Shrubs: Spring Course	April 12	413
Spring Herbaceous Plants	April 12	414
Trees and Shrubs in Spring and Summer	April 15	412
Outdoor Garden Course (for Children)	April 29	417
Wild Flowers and Ferns of the New York Region	April 29	412
Garden Plants and Flowers	May 3	412
Lilacs in Flower	May 3	413
Full Year Courses, 1938-1939		
Genetics	Sept. 20	416
General Botany	Sept. 21	414
Elements of Horticulture	Sept. 28	415

	Date of First Meeting	Page
Trees and Shrubs of Greater New York	Oct.	1 416
Greenhouse Work	Oct.	11 415
Plant Culture	Oct.	13 415
Course for Student Nurses		
General Botany with Special Reference to Medicinal Plants		417
Investigation		
Research in Mycology and Plant Pathology		418
Research in Forest Pathology		418
Research in the Structure of Flowers		418
Research in the Systematic Botany of the Flowering Plants		418

COURSES OF INSTRUCTION

The Brooklyn Botanic Garden offers courses of instruction in botany, gardening, horticulture, and nature study; also opportunity for research, as follows:

- A. For members and the general public ("A" courses, p. 409)
- B. For teachers ("B" courses, p. 414)
- C. For children ("C" courses, p. 416)
- D. Other courses of a special nature ("D" courses, p. 417)
- E. Investigation (p. 417)

Any course may be withdrawn when less than ten persons apply for registration and no course will be given for less than six persons. Since registration in many of the courses is restricted to a fixed number on account of the limited space available in the greenhouses, and for other reasons, those desiring to attend are urged to send in their application for enrollment, with entrance fee, to the Secretary, Brooklyn Botanic Garden, several days in advance of the first exercise. This avoids delay at the beginning of the first exercise, ensures a place in the course, and enables the instructor to provide adequate material for the class.

Enrollment.—Persons are requested not to register in any course unless they are reasonably confident that they can attend the sessions of the class regularly and throughout. This is especially important where the number to be enrolled is limited. To register and not attend may deprive someone else of the privilege

of attending. With the exceptions noted below, no registrations will be accepted for separate class exercises.

Equipment available for the courses:

Three *classrooms*, two *laboratory rooms*, and three *Instructional Greenhouses*; the *Children's Garden*, occupying about $\frac{3}{4}$ of an acre and divided into 150 plots for instruction in gardening; at the north end of the *Children's Garden*, the *Children's Building*, for conferences, and for the storage of tools, seeds, special collections, etc.; the *Auditorium*, on the ground floor, capable of seating 570 persons, and equipped with a motion-picture machine and stereopticon, and electric current, gas, and running water for experiments connected with lectures.

In addition to these accommodations, the dried plant specimens in the herbarium, the living plants in the conservatories and plantations, and the various types of gardens, are readily accessible; while the main library and children's library, which contain a comprehensive collection of publications on every phase of gardening and plant life, may be consulted freely at any time.

A. Courses for Members and the General Public

Although the following courses are designed especially for Members of the Botanic Garden, they are open (unless otherwise specified) to any one who has a general interest in plants. Teachers are welcome. Starred courses (*) are open also for credit to students of Long Island University, and are described in the current Long Island University catalog. In harmony with an agreement entered into in the spring of 1935, the Botanic Garden, upon recommendation of the Chairman of the Biology Department of Long Island University, offers a course scholarship to one student of the University.

Unless otherwise specified, all "A" courses are *free to members*,† but the individual class exercises are open only to those who register for the entire course. Of others a fee is required, as indicated. In courses where plants are raised, these become the property of the class members.

† For information concerning membership in the Brooklyn Botanic Garden consult pages i-iii.

FALL COURSES

A1. Plants in the Home: How to Grow Them.—Five talks with demonstrations. This course deals with the principles to be followed in raising plants, and in maintaining them in a healthy, vigorous condition in the home. Practice in potting, mixing soils, making cuttings, etc. The members of the class have the privilege of keeping the plants they have raised. *On account of restricted space in the greenhouse, this class must be limited to 40 persons. Registration according to the order of application. Fee to non-members, \$6 (including laboratory fee); to members, \$1 laboratory fee. Wednesdays, 11 a.m., November 2 to November 30.*

Mr. Free.

***A5. Trees and Shrubs in Winter.**—Ten outdoor lessons, in the parks and woodlands of Greater New York, on the characteristics of our common trees and shrubs, both native and cultivated, emphasizing their distinguishing features in the winter condition. The habits, requirements as to soil, etc., and the use of various species in landscape art are also discussed. *Fee, \$5. Saturdays, 2:30 p.m., October 1 to December 3.* The first session will be held at the Brooklyn Botanic Garden.

Dr. Graves and Miss Vilkomerson.

A10. Evergreens: How to Know Them.—Ten sessions, outdoors so far as weather permits, for a study of the Botanic Garden's collection of conifers and other evergreens, their habits, uses, and cultivation. Beginning with native conifers, Western and Old World species are studied, including pines, cedars, hemlocks, spruces, firs, yews, cryptomeria, umbrella pine, cypresses, and broad-leaved evergreens. Class members are given small specimens for identification, and seeds of certain species. *Fee, \$5. Wednesdays, 10:45 a.m. to 12 noon. September 21 to November 30 (omitting October 12).*

Dr. Gundersen and Mr. Doney.

A13. Wild Flowers and Ferns of the New York Region.—Six sessions. How to know the common plants of woods and roadsides, including identification of fruits and seeds. *Fee, \$3. Saturdays, 2:30 p.m., September 17 to October 22.* First meeting at the Botanic Garden.

Miss Rusk.

A24. Beginning Course in Fall Greenhouse Work.—Five sessions on potting, plant propagation, bulb culture, etc. (*Not offered in 1938.*) Miss Dorward.

***A31. Ornamental Shrubs.**—Eight sessions, held outdoors in the Botanic Garden, to study the common species and varieties of cultivated shrubs, emphasizing those desirable for planting out on the home grounds. Fall flowers and fruits of ornamental shrubs and small trees, also evergreen shrubs, are considered. This is a continuation of the spring course A30. *Fee, \$4. Wednesdays, 11:00 a.m., September 21 to November 16 (omitting October 12).* Mr. Doney.

A40. Botany for Gardeners.—Eight lectures and discussions on fundamental processes in plant life as applied to gardening and horticulture. Designed especially for those interested in amateur gardening. *Fee, \$4. Tuesdays, 11 a.m., October 25 to December 20 (omitting November 8).* Dr. Svenson.

A42. General Botany.—Same as course B1. *Fee to members, \$5; to non-members, \$10.* Miss Rusk.

A43. Genetics.—Same as course B17. *Fee to members, \$5; to non-members, \$10.* Miss Rusk.

A44. Walks and Talks in the Botanic Garden.—A course designed especially for Members of the Garden and their friends, to enable them to become acquainted with the general plan of the Garden and the nature of the various special gardens, as well as other features of general interest. *No fee. Tuesdays, 4 p.m., October 4 and 18, 1938 and April 11, 25, May 16, and June 6, 1939.* Dr. Graves.

A45. Fall Herbaceous Plants.—Four sessions, for the study of fall-flowering garden plants on the grounds of the Botanic Garden. This is a continuation of A39, but either course may be taken separately. *Fee, \$2. Tuesdays, 4:00 to 5:15 p.m. September 27 to October 18.* Dr. Gundersen.

WINTER COURSE

A22. Trips to the Tropics.—Four guided tours through the Conservatories of the Botanic Garden, with informal, non-technical talks on interesting plants.

1. Foods from far-off lands.
2. Desert gardens.
3. Orchids and pond weeds.
4. Plants of prey.

No fee. Saturday afternoons at 2:00. January 21, 28, February 4, 18. Class limited to twenty.

Dr. Graves and Miss Vilkomerson.

SPRING COURSES

***A9. Trees and Shrubs in Spring and Summer.**—Ten outdoor lessons in the parks and woodlands of Greater New York. Similar to A5, except that the different species are studied in their spring and summer conditions. *Fee, \$5. Saturdays, 2:30 p.m., April 15 to June 17.*

Dr. Graves and Miss Vilkomerson.

A11. Wild Flowers and Ferns of the New York Region.—Six sessions, in the Brooklyn Botanic Garden and in the woodlands near the City, for field identification of flowers and ferns of spring and early summer. *Fee, \$3. Saturdays, 2:30 p.m., April 29 to June 3.* First meeting at the Botanic Garden.

Miss Rusk.

A20. Garden Plants and Flowers.—A course of lectures discussing the cultivation, propagation, and landscape uses of special groups, illustrated with lantern slides and living plants, with accompanying tours in the Botanic Garden. Where possible, propagative material will be distributed to class members. A limited number of bearded iris plants will be available for distribution to those taking the course. To derive the most benefit from the course, one should have a knowledge of the elements of gardening equivalent to that presented in courses A1 or A25. The following dates have been chosen to accord with the time when the particular plant group is at its best in the Garden.

Ornamental Trees May 3	Iris May 24
Lilacs May 10	Ornamental Shrubs . . May 31
Herbaceous Perennials May 17	Roses June 7

Fee, \$5; single exercises, \$1. Wednesdays in May and June, 4:00 p.m. Mr. Free, Dr. Gundersen, Dr. Reed, Mr. Doney.

A25. Spring Garden Work.—A course planned to help those interested in working in their own gardens. The lessons are as follows: making cuttings of herbaceous perennials; sowing seed, and pricking out seedlings; outdoor demonstration of spring garden work. Lectures will include planning and care of the herbaceous border, care of shrubs and the lawn. Class limited to 30 persons. *Fee to non-members \$7 (including laboratory fee); to members, \$2 laboratory fee. Wednesdays, 10:30 a.m., February 8 to March 22 (omitting March 15).*

Miss Shaw and Miss Dorward.

***A30. Ornamental Shrubs: Spring Course.**—Ten outdoor meetings on the grounds of the Botanic Garden. The principal flowering shrubs and small trees are considered at their times of flowering, emphasis being placed on their uses in landscape work, their cultivation, and distinguishing characters. *Fee, \$5. Wednesdays, 11:00 a.m., April 12 to June 14.* Mr. Doney.

A32. Families of Flowering Plants.—Ten outdoor sessions in the Botanic Garden. This course takes up chiefly the structure of flowers and their possible lines of evolution; and the characteristics of important families of flowering plants. (*Not offered in 1939.*) Dr. Gundersen.

A37. Lilacs in Flower.—Five outdoor lessons in the Garden. The unusually comprehensive collection affords opportunity for the study of about twenty species and a large number of the finest varieties of lilacs. In the last lessons, culture and propagation are studied. Cuttings, which become the property of those taking the course, are prepared for rooting. *Fee, \$2.50. Four Wednesdays and one Monday, 10:45 a.m. to 12 noon, May 3, 10, 15, 17, and June 7.* Dr. Gundersen and Mr. Free.

A38. Plant-Animal Links in the Chain of Life.—Three illustrated lectures on the divergent but interdependent evolution

of the two great lines of life: (1) Water plants and water animals. (2) Land plants and cold-blooded animals. (3) Flowering plants and warm-blooded animals. *No fee. Wednesdays, 4 p.m., March 8, 15, and 22.* Dr. Gundersen.

A39. Spring Herbaceous Plants.—Ten outdoor lessons in the Garden, to study the characteristics of the principal perennials and annuals, including rock garden plants, as they come into flower. These include members of the Pink, Buttercup, Poppy, Mustard, Saxifrage, Rose, Pea, Primrose, Mint, Figwort, Composite, Lily, Amaryllis, and other plant families. Small specimens for pressing, and occasional propagative material, are given to class members. *Fee, \$5. Wednesdays, 10:45 a.m. to 12 noon, April 12 to June 14.* Dr. Gundersen.

B. Courses for Teachers

These courses have been accepted by the Board of Education of New York City for "in-service credit," one credit being granted for each 15 hours (with the exception of "B8, Plant Culture"). Through an agreement with Long Island University, undergraduate credit for certain courses will be allowed toward fulfilling the requirements for a university degree, provided the admission requirements at the University and the laboratory requirements have been fulfilled. Such courses are starred (*). By special arrangement with the institution concerned, these credits have also been used as undergraduate credits in other colleges and universities. Nature materials used in the courses, and plants raised become the property of the student.

Members of the Garden are entitled to a 50 per cent. discount from the regular fee for all "B" courses; from other persons the indicated fee is required. Long Island University students desirous of electing any of these or of the "A" courses should notify Dean Tristram W. Metcalfe or Dr. Ralph H. Cheney, who will give the candidate a card entitling him to admission to the course. The student should present this card at the beginning of the first session of the course.

B1. General Botany.—A one-year course not organized as an undergraduate college course in preparation for advanced courses,

but to give a survey of the plant kingdom as a matter of general information and culture. Thirty two-hour sessions on the life activities of plants, and the structures that make these activities possible. Discussions are supplemented by individual study of plants and plant parts—living, whenever possible. In addition to the higher (seed) plants, representatives of the main groups of lower plants are studied: bacteria, algae, fungi, lichens, mosses, and ferns. Four credits. *Fee, \$10. Wednesdays, 4–6 p.m., beginning September 21.* Miss Rusk.

B2. Spring Nature Study.—A thirty-hour course in fifteen two-hour sessions. This course is based on the New York City Syllabus in Nature Study. Miss Farida Wiley, of the American Museum of Natural History, will conduct a field lesson on bird study on a date to be announced. Two credits. *Fee, \$10. Tuesdays, 4–6 p.m., beginning February 7.* Miss Hammond.

B3. Elements of Horticulture.—Thirty sessions. For teachers only. Lessons in potting and general care of house plants; methods of plant propagation, including the planting of bulbs; making cuttings (soft wood, and leaf); sowing seeds; preparing for the outdoor garden. Most of this work is carried on in the greenhouses. Emphasis will be laid on problems of a practical nature. Two credits. *Fee, \$10. Wednesdays, 4 p.m., beginning September 28.* Miss Shaw and Miss Dorward.

B7. Greenhouse Work.—Thirty sessions, throughout the year. For teachers only. A continuation of Elements of Horticulture and open to students who have taken that course. Further study of plant propagation methods; arrangement of plants in hanging baskets, window boxes, dishes, etc.; special culture of certain house plants and winter-flowering greenhouse plants. Two credits. *Fee, \$10. Tuesdays, 4 p.m., beginning October 11.* Miss Dorward.

B8. Plant Culture.—A course of twenty weeks duration for those who have completed Elements of Horticulture and Greenhouse Work. No Board of Education credits are given for this course. (a). Section A is for those who have already taken B8. (b). Section B is for students who have never taken B8, and consists of a series of lectures on plant operations in the outdoor

garden, as well as greenhouse work. *Fee, \$10. Thursdays, 4 p.m., beginning October 13.* Miss Shaw and Miss Dorward.

B10. Flowering Plants: Field and Laboratory Study.—Thirty two-hour sessions on becoming acquainted with species of wild flowering plants, including weeds. (*Not given in 1938–39.*) Miss Rusk.

***B13–14. Trees and Shrubs of Greater New York.**—Twenty two-hour sessions. A course of outdoor lessons in the parks and woodlands of Greater New York, the principal object being to gain a ready acquaintance with the common trees and shrubs of the eastern United States, which are well represented in this region. The species are considered in systematic order, in both winter and summer conditions, and the features pointed out by which they may most easily be recognized. Two credits. *Fee, \$10. Saturdays, 2:30 p.m., October 1 to December 3; and April 15 to June 17, 1939.* Dr. Graves and Miss Vilkomerson.

B17. Genetics.—Thirty class meetings and fifteen two-hour laboratory periods throughout the year. An introductory course in heredity and variation, including discussion of Mendelian principles, the physical basis of heredity, sex linkage, factor linkage, factor interaction, and quantitative inheritance. Laboratory work on plant material and *Drosophila*. Prerequisite: an elementary course in botany. Four credits. *Fee, \$10. Tuesdays, 4 p.m., beginning September 20; and Fridays, 4 p.m., beginning October 21.* Miss Rusk.

C. Children's Courses

More than thirty separate courses are given Saturday mornings for boys and girls from eight to nineteen years old in the spring, fall, and winter.

The children are grouped according to age and experience. For example, under I (below), twelve separate courses are given; under II, four separate courses; under III, fourteen. Under IV, the Outdoor Garden, 200 children are working from late April to mid-September. This does not represent one course, but many courses combined under one heading, "The Outdoor Garden."

Miss Shaw and Assistants.

I. The Fall Course takes up nature study on the grounds; plant propagation in the greenhouses, using stem and leaf cuttings; bulbs and corms; making of terrariums and dish gardens. Enrollment limited to 175 children. *Fee, ten cents. Saturday mornings, 9–11:15, October 15 to December 17.*

II. Winter Course.—Children who have shown unusual ability are chosen from the fall group for early winter work. Group limited to 50. No fee. *Saturday mornings, 9–11:15, January 21 to February 18.*

III. Spring Course.—Nature study and preparation for the outdoor garden, including studies of seed germination, seed sowing in the greenhouse, and the making of garden plans. All candidates for the outdoor garden must be in spring classes. Enrollment limited to 200. *Fee, ten cents. Saturday mornings, 9–11:15, March 4 to April 15.*

IV. Outdoor Garden Course.—The outdoor garden is open throughout the summer season, and time is arranged to fit in with children's vacation schedules. No child is assigned an outdoor garden who has not had the spring preparatory work. Group limited to 200 children. *Fee, twenty-five or thirty-five cents depending on the size of the garden. The garden session begins April 29.*

D. Course for Student Nurses

D1. General Botany with Special Reference to Medicinal Plants.—A course of 10 spring and 10 fall lectures, demonstrations, and field trips for student nurses. Arranged in cooperation with various hospitals. The general principles governing the life of plants, as well as the use and care of flowers and potted plants in the sick room, will be considered. Special attention will be paid to the outdoor identification of officinal plants. Hours to be arranged. *No fee.* Dr. Graves.

E. Investigation

1. Graduate Work for University Credit

By the terms of a cooperative agreement between New York University and the Brooklyn Botanic Garden, properly qualified

graduate students may arrange to carry on independent investigations in botany at the Garden under the direction of members of the Garden Staff, who are also officers of instruction in the Graduate School of the University. The advantages of the library, laboratories, herbarium, and collections of living plants at the Garden are freely at the disposal of students registered at New York University for such work. Such properly enrolled graduate students are charged no additional fees by the Garden. Research in the following fields may be undertaken:

- E6. Research in Mycology and Plant Pathology.** Dr. Reed.
- E8. Research in Forest Pathology.** Dr. Graves.
- E9. Research in the Structure of Flowers.** Dr. Gundersen.
- E10. Research in the Systematic Botany of the Flowering Plants.** Dr. Svenson.

2. Independent Investigation

The facilities of the laboratories, conservatories, library, and herbarium are available to qualified investigators who wish to carry on independent researches in their chosen field of botany. By "qualified investigators" is meant those who have obtained the doctor's degree or have completed most of the requirements for the doctorate. The laboratories are open for such use only during the hours when the Laboratory Building is regularly open, viz. 9 a.m.—5 p.m. Mondays to Fridays; 9–12 a.m. Saturdays, except on holidays when the building is closed. There is a charge of \$25 per year, payable to the Botanic Garden.

COOPERATION WITH LOCAL SCHOOLS

The Brooklyn Botanic Garden aims to cooperate in every practicable way with the public and private schools of Greater New York in all matters pertaining to the study of plants and closely related subjects. The purpose of the Garden in this connection is to supplement and enrich the school work in the way of instruction, demonstration methods, study material, etc., which otherwise would not be available.

Geography classes, as well as classes in nature study and botany, find the collection of useful plants in the Economic Plant House, the Local Flora Section, the Japanese Garden, and also the Meridian Panel, the Armillary Sphere, and the Labeled Boulders, valuable adjuncts to their class work. Arrangements may be made by teachers of geography to have their classes study these collections under guidance. Illustrated lectures at the Garden for geography classes may also be arranged.

To visiting college classes in geology and physiography the Botanic Garden offers interesting material for a study of glaciation. Notable features are a portion of the Harbor Hill terminal moraine (Boulder Hill), the morainal pond (the "Lake"), the labelled glacial boulders, and the Flatbush outwash plain. See Guide No. 7, "*The Story of our Boulders: Glacial Geology of the Brooklyn Botanic Garden.*"

Talks at Elementary Schools.—The principals of public or private elementary schools may arrange to have talks given at the schools on various topics related to plant life, such as school gardens and garden work with children, tree planting, the conservation of wild flowers, Arbor Day, etc. If an illustrated lecture is desired, the lantern and operator must be provided by the school, but slides will be furnished by the Botanic Garden. Address the *Curator of Elementary Instruction* for a list of talks and for appointments.

Talks at Secondary Schools and Colleges.—Informal illustrated talks on various subjects of an advanced botanical nature are always gladly given at Secondary Schools and Colleges by members of the staff. Arrangements for such talks should be made with the *Curator of Public Instruction*.

School Classes at the Garden.—Public or private schools, both elementary and secondary, may arrange for classes to come to the Botanic Garden for illustrated lectures by a member of the Garden staff, or for guided tours through the conservatories and outdoor plantations. Such lectures, conservatory trips, and outdoor trips are planned for correlation with the New York City school syllabi in nature study, biology, and geography.

Visiting classes must be accompanied by their teachers, and notice of such visits should be sent at least one week in advance. Blank forms for this purpose are provided by the Garden. Lists of talks and trips offered will be sent on request: for Junior High and Elementary Schools address the *Curator of Elementary Instruction*; for High Schools, the *Curator of Public Instruction*.

The Garden equipment, including plant material, lecture rooms, lantern, and slides, is at the disposal of teachers who desire to instruct their own classes at the Garden. Arrangements must be made in advance, so that such work will not conflict with other classes and lectures. For High School and College classes address the *Curator of Public Instruction*. For Junior High and Elementary School classes address the *Curator of Elementary Instruction*.

The principal of any Elementary or High School in Brooklyn may arrange also for a series of six lessons on plant culture to be given to a class during the fall or spring. A small fee is charged to cover the cost of the materials used. The plants raised become the property of the pupils. The lessons are adapted for pupils above the third grade.

Special classes for the blind may be arranged. A week's notice is asked so that plant material in sufficient amount may be ready.

Seeds for School and Home Planting.—Penny packets of seeds are put up by the Botanic Garden for children's use. In the early spring, lists of these seeds, order blanks for teachers and pupils, and other information may be secured on application to the *Curator of Elementary Instruction*.

Demonstration Experiments.—Teachers may arrange to have various physiological experiments or demonstrations conducted at the Garden for the benefit of their classes. Communications in regard to these matters should be addressed to the *Curator of Public Instruction*.

Loan Sets of Lantern Slides.—Sets of lantern slides have been prepared for loan to the schools. Each set is accompanied by a short lecture text of explanatory nature. In all cases these sets must be called for by a responsible school messenger and re-

turned promptly in good condition. Address, by mail or telephone, Mr. Frank Stoll. The subjects now available are as follows. Other sets are in preparation.

- | | |
|------------------------|----------------------------------|
| 1. Plant Life | 4. Fall Wild Flowers |
| 2. Spring Wild Flowers | 5. Forestry |
| 3. Common Trees | 6. Conservation of Native Plants |

Study and Loan Material for Elementary Schools.—To the extent of its facilities, the Botanic Garden will provide, on request, various plants and materials for nature study. As far as possible this material will continue to be supplied gratis to elementary schools in case one or more of their teachers are members of regular Botanic Garden classes. Requests from Elementary Schools should be made to Miss Elsie T. Hammond, and material should be called for at the Information Booth on the ground floor.

Study and Loan Material for High Schools, Junior High Schools, and Colleges

Available at the Brooklyn Botanic Garden, 1938–1939

The Botanic Garden is able to supply various plants and plant parts for study; certain protozoa; sterilized nutrient agar; and also material and mounts for exhibit purposes. When containers are necessary, as in the case of agar, algae, and protozoa, they must be furnished by the school.

In the past, the Garden has offered this service gratis, but both on account of the increasing demand and because of the decrease in appropriations, it has become necessary to make a small charge for the material supplied or loaned. A Price List of the various materials furnished will be mailed on request.

Requests should be made by mail or telephone (PRospect 9–6173), at least one day in advance, to Dr. Elizabeth Marcy, and the material should be called for at Room 204. All exhibit material, and other items starred (*) will be mailed if the school pays postage.

LIVING MATERIAL—PLANTS

Algae: 1. Spirogyra, *Pleurococcus, Vaucheria, Desmids, Oscillatoria. 2. *Spirogyra conjugating—preserved material.

Bacteria: 3. *Slant cultures of *B. coli*, *B. subtilis*, *Pseudomonas radicicola*, *Sarcina flava*.

Fungi: Plus and minus strains of bread mold (*Rhizopus nigricans*). 4. *Spores for inoculation. 5. Cultures of each strain. 6. Petri dish inoculated with both strains showing lines of zygospores.

Liverworts:

Thallus only—7. *Marchantia*. 8. *Conocephalum*.

Thallus with gemmae cups—9. *Marchantia*. 10. *Lunularia*.

Mosses: 11. *Protonema*. 12. Felt. 13. Felt with capsules.

Ferns: 14. *Prothallia*. 15. Fern fronds with spores—various species.

Angiosperms:

Plants: For photosynthesis experiments. 16. *Tradescantia*.

17. Green geranium. 18. Silver geranium.

With fleshy leaves: 19. *Bryophyllum*. 20. *Sedum*.

Sensitive: 21. *Mimosa pudica*.

Leaves: 22. *Sedum*, *Sansevieria*, Coffee, and others. 23. *Bryophyllum*—for plant propagation.

Stems: 24. *Twigs to show opposite and alternate leaf arrangement, thorns, terminal buds, etc., 9–12".

Cuttings: (Unrooted or rooted). 25. *Tradescantia*. 26. *Begonia*. 27. *Geranium*. 28. *Coleus*.

Material for the study of genetics:

29. *Sorghum seeds for growing F_2 seedlings showing Mendelian ratios:

Red and green seedling color (3:1)—seeds for parents and F_2 .

Normal and albino seedlings—lethal factor (3:1).

30. *Pea seeds of tall and dwarf strains.

31. Seedlings of any of the above.

LIVING MATERIAL—ANIMALS

32. Cultures of *Paramecia*, *Euglena*.

33. *Drosophila*—wild type, white, sepia, vestigial.

STERILIZED AGAR

34. Petri dishes, test tubes, or flasks, sent in clean and dry, one

week in advance, will be filled with sterile nutrient agar, or with potato dextrose agar for the study of bacteria and molds.

SPECIMENS AND MOUNTS FOR EXHIBIT

Illustrating the principles of genetics:

Pea seeds illustrating a dihybrid ratio (wrinkled, smooth, yellow, green). 35. In vials. 36. Riker mount.

37. Jimson weed (*Datura*)—mount to show F_2 segregation of spiny and smooth pods.

Corn showing monohybrid and dihybrid ratios:

38. Ears of parents and F_2 —seed of F_1 in vial—unmounted.

39. Same mounted in glass covered display case.

40. F_2 ears in glass tubes—for counting kernels.

41. Sorghum—Hybrid vigor—Riker mount of parents and F_1 .

42. Sorghum—Inheritance of seed color—Riker mount.

43. Oats—Mendelian inheritance of hull color—Riker mount.

44. Snapdragon—Inheritance of flower color—Riker mount.

Economic plants: 45. Bundles of cereal grains (barley, oats, rice, rye, sorghum, wheat).

Fungi and plant diseases: 46. Bracket fungi—unmounted.

Leaves showing leaf spot diseases (rusts, mildews, and others).

47. Unmounted. 48. Mounts covered with cellophane.

49. Riker mount—specimens of six diseases.

Mosses and Ferns: Mounts covered with cellophane.

50. Life history of a moss plant—*Polytrichum commune*.

Angiosperms:

51. Riker mount showing leaf modifications.

52. Fruits of trees, flowering plants, weeds, lotus pods—loose.

53. Riker mount to show methods of seed dispersal.

LIBRARY

The rapidly growing library of the Garden comprises at present about 20,000 volumes and about 17,000 pamphlets. This is not a circulating library, but is open free for consultation to all persons daily (except Sundays and holidays) from 9 a.m. until 5 p.m. (Saturdays, 9 to 12). More than 1,000 periodicals and serial

publications devoted to botany and closely related subjects are regularly received. These include the transactions of scientific societies from all quarters of the globe; the bulletins, monographs, reports, and other publications of various departments of the United States Government, as well as those of foreign governments, and of all state agricultural experiment stations and agricultural colleges; the publications of research laboratories, universities, botanic gardens, and other scientific institutions of the world, as well as the files of independent journals devoted to the various phases of plant life. The library is specially rich in publications of foreign countries and has a growing collection of incunabula and other pre-Linnean works.

Bibliographical assistance is rendered to readers by members of the Library staff.

An annotated list of the incunabula, pre-Linnaean works, old herbals and other rare or historically important books in the Library was published as the July, 1935, number of the Botanic Garden RECORD. Copies are for sale at 40 cents each.

BUREAU OF PUBLIC INFORMATION

Consultation and advice, and the facilities of the library and herbarium are freely at the service of members of the Botanic Garden and (to a limited extent) of others with special problems relating to plants or plant products, especially in the following subjects:

1. Plant diseases and determination (naming) of fungi.
2. Plant geography and ecology.
3. Determination of flowering plants.
4. The growing of cultivated plants and their arrangement; also their adaptation to soils, climate, and other factors.
5. The care of trees, shrubs, and lawns, and general gardening problems.

Inquiries should be directed to the *Curator of Public Instruction*, preferably by letter.

Determination of Specimens.—If the identification of plants is desired, the material submitted should include flowers, and fruit

when obtainable. Identification of a single leaf is often impossible. For identification of plant diseases, representative portions of the part diseased should be sent.

DOCENTRY

To assist members and others in studying the collections, the services of a docent may be obtained. Arrangements should be made by application to the *Curator of Public Instruction* one week in advance. No parties of less than six adults will be conducted. This service is free of charge to members and accompanying friends; to others there is a charge of 50 cents per person. For information concerning membership in the Botanic Garden see pages i-iii of this PROSPECTUS.

EXTRA-MURAL LECTURES

The Botanic Garden does not officially schedule members of its personnel for lectures or talks outside the Botanic Garden, except for lectures on the Garden itself or some aspect of its work. In such cases no fee is charged beyond traveling expenses.

Several members of the personnel are available for lectures to garden clubs and other organizations on topics of general horticultural or botanical interest. A list of lecturers, with lecture topics and the fee charged, may be had by addressing the *Curator of Public Instruction*.

MEETINGS OF OUTSIDE ORGANIZATIONS

The Brooklyn Botanic Garden is glad to welcome outside organizations wishing to hold meetings at the Garden, provided the general purpose of the organization is closely allied to that of the Botanic Garden (e.g., Botanical Groups, Garden Clubs, Nature Study Clubs, Conservation organizations, etc.), or that the specific purpose of the meeting is of mutual interest and advantage to the organization and the Botanic Garden. Meetings must always be arranged for in advance. A folder giving full details, and an application blank may be had by addressing *The Custodian*.

INDEX TO VOLUME XXVII

- Acetaria, a Discourse of Sallets, 100
 Acoustic Treatment for Room 330, 27
 Admission, Free, 15
 Adult Classes, 71
 Courses, 60
 Albaum, Harry G., 44
 American Fern Journal, 97
 Fern Society Collection, 95
 Horticultural Society, 81
 Rock Garden Society, 81
Amorphophallus Rivieri, 80
 Arai, Mrs. Yoneo, 60
 Associated Hospital Service, 30
 Attendance, 13, 58
 at Classes and Lectures, 59
 Conservatories, 59

 Barens, Emil, 74
 Benedict, Ralph C., 98
 Bequests and Gifts, 32
 to the Brooklyn Botanic Garden,
 Forms of, Preceding p. 11
 Bird Lists, 68
 Blind, Work for the, 24
 Blue Ridge Graduate College, 72
 Board of Education, 23
 Higher Education, 24
 Botanic Garden versus Park, 13
 Gardens of the World: Materials
 for a History, 2nd edition, 15
 Botanical Society of America, 26
 Boy Scout Examinations, 67
 Brandwein, Paul F., 44
 Brennan, Bernard P., 68
 Brooklyn Botanic Garden Publica-
 tions, 1937, Report on, 133
 College Campus, 25
 Bureau of Information, 68

 Caffeine and Coffee Pharmacology, 58
 Carroll, Michalena, 31, 72
 Cheney, Ralph H., 58, 99
 Chestnut Breeding Work in 1937, 44
 Children's Garden, 71
 City, The Botanic Garden and the,
 Preceding p. 11
 City-wide Service, 73

 Classes, Adult, 71
 and Lectures, Attendance at, 59
 Outdoor, 76
 Cocos Island, 58
 Coffee Pharmacology, Caffeine and, 58
 Conifers, 73
 Conservation, Plant 98
 Conservatories, 79
 Attendance at, 59
 Consultations with Teachers, 73
 Contributions and Memoirs, 134
 Recovery and, 36
 Cooperation, 23
 Miscellaneous, 28
 Cranford, Mrs. Walter V., 33
 Culinary Garden, Medicinal and, 79
 Curator of Plants, Report of the, 73
 Cutting, Mr. and Mrs. Suydam, 29

 Davenport, Mrs. Henry J., 60
 Delectus Seminum, Brooklyn 1937, 1
 Department of Education, Coopera-
 tion with the, 68
 DeVries Window Tablet, 27
 Dicotyledons, The Classification of, 55
 Director, Report of the, 11
 Doney, C. F., 75
 Downs, Daniel C., 103

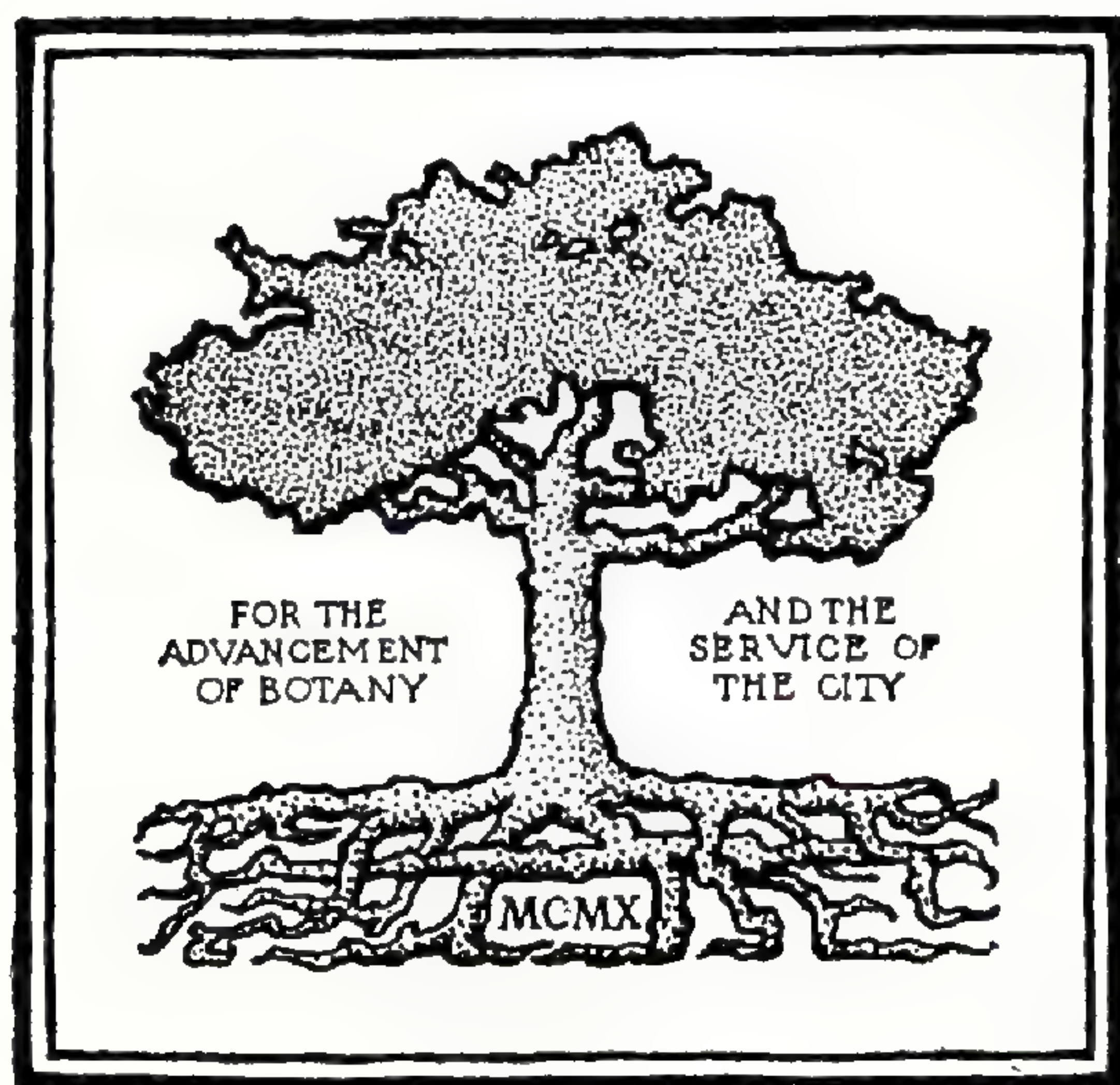
 Ecology, 133
 Economic House, Repair of the, 25
 Plants, 58
 Education, Adult, 19
 Board of, 23
 Higher, 24
 Cooperation with the Department
 of, 68
 Elementary, 20
 Public, 19
 Eidlitz, Mrs. Ernest Frederick, 60
 Elementary Instruction for 1937,
 Report of the Curator of, 70
Elcocharis, 57
 Endowment Increment Plan, 35
 Esson, James G., 63
 European Trip, 82
 Evelyn, John, 100
 "Exhibit of the Week," 63

- Farmingdale Iris Garden, 41
 Federated Garden Clubs of New York State, 81
 Fern Work, 97
 Field Secretary for 1937, Report of the, 99
 Trips Conducted, 1937, 130
 Financial, 33
 Statement for 1937, 101
 Flower Days, 63
 Show, The International, 28
 Structures, 55
 Free, Montague, 31, 81
- Gager, C. Stuart, 36
 Galapagos Islands, 58
 Garden Club of America, 81
 Clubs, 30
 Gates, Guards at the, 16
 The Need of Suitable Entrance, 14
 Genetics, 133
 Gift, Anonymous, 32
 Gifts Received During 1937, 104
 Gillies, G. H., 63
 Girls Commercial High School Memberships, 32
 Graduate Students and Independent Investigators Enrolled During 1937, 44
 Graves, Arthur Harmount, 44, 70
 Guards at the Gates, 16
 Gundersen, Alfred, 55, 77
- Hart, Mrs. Ronald, 60
 Hammitt, Walter, 30
 Hammond, Miss, 73
 Herbarium, 23
 Accessions and Distribution, 87
 for 1937, Report of the Curator of the, 81
 Material Borrowed for Study, 86
 Loaned, 86
 Horticultural Section, 78
 Horticulturist for 1937, Report of the, 78
- Income, Diminished, 33
 Information, Bureau of, 68
 International Flower Show Exhibits, 80
 Iris, 41
 Collections, 76
 Garden, Farmingdale, 41
 Rhizome, Soft Rot of the, 42
 Thrips Control, 43
- Japanese Beetles, 80
 Jones, Helen Swift, 100
 Jordan, William E., 95
- Kings County Hospital, 61
 Kingston Avenue Hospital for Contagious Diseases, 29
 Knapp, H. B., 43
- Labels and Signs, 77
 suspended, 76
 Lake, walk around, 80
 Lanman, David H., 30
 Lawton, Elva, 44
 Leaflets, 69, 134
 Lectures, Attendance at Classes and, 59
 Library, 22, 105
 for 1937, Report on the, 88
 Statistical Report on the, 95
 Lilacs, 74
 Lincoln, Mrs. Roy M., 60
 Loan Lectures, 69
 Loans, Interlibrary, 92
 Local Flora Section, 16, 85
- Maddock Bequest, 32
 Map of the Garden, 76
 Marcy, D. Elizabeth, 40
 McCallum, John, 77
 Medicinal and Culinary Garden, 79
 Members, List of, 137
 Membership, 31
 Information Concerning, Preceding p. 11, 407
 Privileges of, Preceding p. 11, 407
 Summary of, 149
 Memberships, Girls Commercial High School, 32
 Memoirs, Contributions and, 134
 Merchants Association of New York, 28
 Merrill, Gertrude W., 100
 Miner, Frances E., 31
 Moss Ravine, 17, 75, 79
- Nephrolepis*, 97
 Nurses-in-training, Course for, 61
 Training Classes, 29
- Organizations Meeting at the Garden, 1937, 131
 Overlook, 80
- Parks, Department of, 25
 Park versus Botanic Garden, 13

- Pathology, Forest, 44
- Plant, 36
- Personnel, 30, 78
- Photographic Work, 132
- Plantations, 15
- Plant Distribution, Seed and, 80
- Plantings, 75
- Plants, Statistics Relating to Living, 76
- Pratt, Philip H., 60
- Preparation and Distribution of Material, 72
- Private Funds, Tax Budget and, 34
- Prospect Heights Hospital, 61
- Prospectus: 1938-1939, 00.
- Publications by the Botanic Garden Personnel During 1937, 113
- Public Education, 19
 - Instruction for 1937, Report of the Curator of, 58
 - Lectures, 69
 - The Garden and the, 13
 - The People and the, 15
- Publicity, 66
- Radio Garden Club, 29
 - Talks by the Botanic Garden Personnel During 1937, 129
- Record, Brooklyn Botanic Garden, 134
- Reed, George M., 36, 41
- Report of the Brooklyn Botanic Garden, 1937, Twenty-Seventh Annual, 11
- Research, 17
 - for 1937, Reports on, 36
- Resident Investigator (Economic Plants) for 1937, Report of the, 98
 - (Ferns) for 1937, Report of the, 96
- Rose Arc, 79
 - Garden, 78
 - Bronze Statue for the, 33
- St. John's Hospital, 61
- St. Mary's Hospital, 61
- Scholarship, 24
- School Service, 96
 - Statistics of, 62
- Science and Sciscitation, 19
- Seed and Plant Distribution, 80
 - Exchange, 77
- Seeds Offered in Exchange, List of, 1
- Shaw, Ellen Eddy, 20, 73
- Smut Development, Influence of the Growth of the Host on, 36
 - Investigations, Sorghum, 40
- Smuts, Physiologic Races of the Oat, 38
 - Studies on Cultures of the Oat, 39
 - Studies on the Inheritance of Resistance of Oat Hybrids to Loose and Covered, 37
- Sorghum Smut Investigations, 40
- Spring Inspection, 91
- Spry, Constance, 100
- State Institute of Applied Agriculture on Long Island, 41
- Street Number Sign, 26
- Svenson, Henry K., 57
- Systematic Botany, 55, 57
 - Section, 78
- Talks, Lectures, Addresses, and Papers Given by the Botanic Garden Personnel During 1936, 120
- Tax Budget and Private Funds, 34
- Teachers, Consultations, with, 73
- The Sun, 73
- Thorsen, Oswald, 31
- Tilley, S. R., 63
- Trustees, Officers of the Board of, 135
- Utter, Gordon L., 39, 43
- Victoria, B. C., Department of Parks, 30
- Wernberg, Gosta, 31
- White, Frances E., 11
- Woman's Auxiliary, 30, 136
- Works Progress Administration, 26, 78
- World's Fair, 1939, Horticulture in the New York, 27
- Yale, Rare Woods Sent to, 67

BROOKLYN BOTANIC GARDEN RECORD

EDITED BY
C. STUART GAGER



VOLUME XXVII

1938

PUBLISHED QUARTERLY
AT PRINCE AND LEMON STREETS, LANCASTER, PA.
BY THE BROOKLYN INSTITUTE OF ARTS AND SCIENCES
BROOKLYN, N. Y.

TABLE OF CONTENTS OF VOLUME XXVII

No. 1, JANUARY

Delectus Seminum, Brooklyn 1937 (List of Seeds Offered in Exchange)	1
---	---

No. 2, APRIL

The Botanic Garden and the City	Preceding page	11
Information Concerning Membership	Preceding page	11
Privileges of Membership	Preceding page	11
Forms of Bequest to the Brooklyn Botanic Garden	Preceding page	11
Twenty-Seventh Annual Report of the Brooklyn Botanic Garden, 1937 .		11
Report of the Director		11
Reports on Research for 1937		36
Report of the Curator of Public Instruction		58
Report of the Curator of Elementary Instruction		70
Report of the Curator of Plants		73
Report of the Horticulturist		78
Report of the Curator of the Herbarium		81
Report of the Library		88
Statistical Report on the Library		95
Report of the Resident Investigator (Ferns)		96
Report of the Resident Investigator (Economic Plants)		98
Report of the Field Secretary		99
Financial Statement for 1937		101
1. Tax Budget Accounts		101
2. Private Funds Accounts		102
3. Summary of Total Maintenance Budget for 1937		103
Gifts Received During 1937		104
Publications by the Botanic Garden Personnel During 1937		113
Talks, Lectures, Addresses, and Papers Given During 1937		120
Radio Talks by the Botanic Garden Personnel During 1937		129
Field Trips Conducted		130
Organizations Meeting at the Garden, 1937		131
Report of Photographic Work		132
Report on Brooklyn Botanic Garden Publications		133
Officers of the Board of Trustees		135
Members of the Board		135
Woman's Auxiliary		136
List of Members		137
Summary of Membership		149

No. 3, JULY

Botanic Gardens of the World: Materials for a History, 2d edition ...	151
---	-----

Prospectus: 1938–1939	407
Information Concerning Membership	i
Privileges of Membership	ii
Out-of-Town Membership Privileges	iii
Regulations Concerning Photographing, Painting, and Sketching ..	iv
List of Courses Offered	407
Courses of Instruction	408
Cooperation with Local Schools	418
Library	423
Bureau of Public Information	424
Docentry	425
Extra-mural Lectures	425
Meetings of Outside Organizations	425

The Brooklyn Institute of Arts and Sciences

OFFICERS OF THE BOARD OF TRUSTEES

CHAIRMAN

EDWARD C. BLUM

FIRST VICE-PRESIDENT

WALTER H. CRITTENDEN

SECOND VICE-PRESIDENT

ADRIAN VAN SINDEREN

THIRD VICE-PRESIDENT

SUMNER FORD

TREASURER

EDWIN P. MAYNARD

SECRETARY

JOHN H. DENBIGH

BOTANIC GARDEN GOVERNING COMMITTEE

MISS HILDA LOINES, *Chairman*

PHILIP A. BENSON

WALTER HAMMITT

EDWARD C. BLUM, *Ex officio*

WILLIAM T. HUNTER

MRS. WILLIAM H. CARY

DAVID H. LANMAN

WALTER H. CRITTENDEN

JAMES G. McDONALD, *Ex officio*

MRS. LEWIS W. FRANCIS

EDWIN P. MAYNARD

ALFRED E. MUDGE

EX OFFICIO MEMBERS OF THE BOARD

THE PRESIDENT, THE BROOKLYN INSTITUTE OF ARTS AND SCIENCES

JAMES G. McDONALD, LL.D.

THE FOLLOWING OFFICIALS OF THE CITY OF NEW YORK

THE MAYOR

THE COMPTROLLER

THE COMMISSIONER OF PARKS

GENERAL INFORMATION

MEMBERSHIP.—All persons who are interested in the objects and maintenance of the Brooklyn Botanic Garden are eligible to membership. Members enjoy special privileges. Annual Membership, \$10 yearly; Sustaining Membership, \$25 yearly; Life Membership, \$500. Full information concerning membership may be had by addressing *The Director, Brooklyn Botanic Garden, 1000 Washington Avenue, Brooklyn, N. Y.* Telephone, Prospect 9-6173.

THE BOTANIC GARDEN is open free to the public daily from 8 a.m. until dusk; on Sundays and Holidays it is open at 10 a.m.

ENTRANCES.—On Flatbush Avenue, near Empire Boulevard and near Mt. Prospect Reservoir; on Washington Avenue, south of Eastern Parkway and near Empire Boulevard; on Eastern Parkway, west of the Museum Building.

The street entrance to the Laboratory Building is at 1000 Washington Avenue, opposite Crown Street.

To ASSIST MEMBERS and others in studying the collections the services of a docent may be obtained. This service is free of charge to *members of the Botanic Garden*; to others there is a charge of 50 cents per person. Arrangements must be made by application to the Curator of Public Instruction at least one day in advance. No parties of less than six adults will be conducted.

To REACH THE GARDEN take Broadway (B.M.T.) Subway to Prospect Park Station; Interborough Subway to Eastern Parkway-Brooklyn Museum Station; Flatbush Avenue trolley to Empire Boulevard; Franklin Avenue, Lorimer Street, or Tompkins Avenue trolley to Washington Avenue; St. John's Place trolley to Sterling Place and Washington Avenue; Union Street or Vanderbilt Avenue trolley to Prospect Park Plaza and Union Street. By AUTOMOBILE from points on Long Island take Eastern Parkway west and turn left at Washington Avenue; from Manhattan, take Manhattan Bridge, follow Flatbush Avenue Extension and Flatbush Avenue to Eastern Parkway, turn left following Parkway to Washington Avenue; then turn right.

BROOKLYN BOTANIC GARDEN PUBLICATIONS

RECORD. Established, January, 1912. An administrative periodical issued quarterly (1912-1928); bimonthly (1929-1932); quarterly (1933-). Contains, among other things, the *Annual Report* of the director and heads of departments, special reports, announcements of courses of instruction, seed list, guides, miscellaneous papers, and notes concerning Garden progress and events. Free to members of the Garden. To others \$1.00 a year. Circulates in 59 countries.

MEMOIRS. Established, July, 1918. Published irregularly. Circulates in 47 countries.

Volume I. *Dedication Papers*: 33 scientific papers presented at the dedication of the laboratory building. 1917. 521 pages. \$3.50, plus postage.

Volume II. The vegetation of Long Island. Part I, The vegetation of Montauk: A study of grassland and forest. By Norman Taylor, June 11, 1923. 108 pages. \$1.00, plus postage.

Volume III. Vegetation of Mount Desert Island, Maine, and its environment. By Barrington Moore and Norman Taylor. 1927. 151 pages. \$1.60.

CONTRIBUTIONS. Established, 1911. Papers originally published in periodicals, reissued as "separates" without change of paging. 25 numbers constitute one volume. 25 cents each, \$5.00 a volume. Circulates in 34 countries.

No. 79. *The iris thrips and its control by hot water, with notes on other treatments*. 12 pages. 1937.

No. 80. *Inheritance of resistance to loose and covered smuts in Markton oat hybrids*. 17 pages. 1938.

No. 81. *Inheritance of resistance to loose and covered smuts in oat hybrids*. 10 pages. 1937.

No. 82. *Culture and inoculation studies on races of the loose and covered smuts of oats*. 13 pages. 1938.

No. 83. *Pteridophyta of the Galapagos and Cocos Islands*. 31 pages. 1938.

No. 84. *Influence of the growth of the host on oat smut development*. 24 pages. 1938.

LEAFLETS. Established, April 10, 1913. Published weekly or biweekly during April, May, June, September, and October. The purpose of the *Leaflets* is primarily to give announcements concerning flowering and other plant activities to be seen in the Garden near the date of issue, and to give popular, elementary information about plant life for teachers and others. Free to members of the Garden. To others, fifty cents a series. Single numbers 5 cents each. Circulates in 28 countries. Temporarily discontinued since 1936.

GUIDES to the collections, buildings, and grounds. Price based upon cost of publication. Issued as numbers of the RECORD; see above.

Guide No. 5. *The Rock Garden*. 28 illustrations. Price, 35 cents. By mail, 40 cents.

Guide No. 6. *Japanese potted trees (Hachinoki)*. 11 illustrations. Price, 35 cents. By mail, 40 cents.

Guide No. 7. *The story of our boulders: Glacial geology of the Brooklyn Botanic Garden*. 22 illustrations. Price, 35 cents. By mail, 40 cents.

Guide No. 8. *The story of fossil plants*. 8 illustrations. Price, 35 cents. By mail, 40 cents.

SEED LIST. (*Delectus Seminum*) Established, December, 1914. Since 1925 issued each year in the January number of the RECORD. Circulation includes 160 botanic gardens and institutions located in 40 countries.

ECOLOGY. Established, January, 1920. Published quarterly in coöperation with the ECOLOGICAL SOCIETY OF AMERICA. Subscription, \$4.00 a year. Circulates in 48 countries.

GENETICS. Established, January, 1916. Bimonthly. Subscription, \$6.00 a year. Circulates in 37 countries.