

THE DIRECTOR'S REPORT

THE ARNOLD ARBORETUM DURING THE FISCAL YEAR ENDED

JUNE 30, 1964

FROM THE POINT OF VIEW of active participation and representation in the many areas of its interest, the year just completed was a varied and successful one for the Arnold Arboretum. Several staff members made extended and intensive field trips which yielded botanical and horticultural collections, series of photographs, and impressions of value which will contribute significantly to their current and future work. The number and quality of published contributions by the staff continued at a high level. The Arboretum was represented at several professional meetings, and, in turn, welcomed many distinguished visitors.

At the open house scheduled for visitors on successive week-ends in May a moderate number came to Weston to the Case Estates. At Jamaica Plain, however, which is more easily accessible, the crowd was almost overwhelming in its enthusiastic pleasure with the flowering display.

Staff:

On January 1, Dr. Lily M. Perry retired officially from the staff of the Arnold Arboretum. Miss Perry, who joined the Arboretum staff in 1937, worked for a number of years closely with the late E. D. Merrill and was coauthor with him of a long series of papers on the flora of New Guinea. More recently, Dr. Perry has been compiling information on the medicinal plants of southeastern Asia. When this manuscript is published she plans to return to her major interest, work on the New Guinea flora, and will continue to be of assistance to the Arboretum staff on problems of the southeastern Asiatic area. Her long and devoted service has been of inestimable value to the institution and to all her colleagues.

During the year also, Mrs. Susan Delano McKelvey requested her retirement as a member of the Committee to Visit the Arnold Arboretum and as a Research Associate on the staff. Her services, which have been continuous since 1920, are deeply appreciated.

Dr. Lorin I. Nevling, Jr., was appointed Associate Curator and Supervisor of the Herbaria, jointly with the Gray Herbarium, to be in charge of the herbarium collections in Cambridge and in Jamaica Plain.

Dr. Shirley A. Graham, who had recently completed her doctoral studies at the University of Michigan, joined the staffs of the Arboretum and the Gray Herbarium in September to work for a year on the Southeastern Flora Project.

Mr. Andrey Baranov was appointed Curatorial Assistant. His special abilities with the flora of Manchuria will aid the staff in handling the accumulated collections from eastern Asia. The appointment of Dr. Mary E. Sanders as a Research Associate was renewed, as was the Mercer Fellowship awarded to Dr. Lalit Srivastava.

Dr. Howard was appointed to the Scientific Advisory Committee of the Fairchild Tropical Garden and to the Committee on Pioneering Research of the National Academy of Sciences — National Research Council.

Dr. Wyman was elected a Vice President of the International Dendrological Union and continued his services as a Director of the American Horticultural Society and as a Trustee of the Massachusetts Horticultural Society. At the International Shade Tree Conference held in Canada, the "Author's Citation" of that organization was awarded to Dr. Wyman "for sustained production of excellent books in the field of arboriculture."

Horticulture:

The climate of the past year was again unusual. The summer was dry with prolonged drought so that when the first rains came on October 1 there was a deficiency of ten inches in an expected normal rainfall, to that date, of 31 inches. During the winter, however, total precipitation became normal. Precipitation as snow, moreover, was the heaviest in 17 years, with a total of 63 inches. No severe storms were experienced, but an unusual one occurred on March 10 when sleet fell for eleven hours, accumulating to a depth of two inches before turning to snow.

The effect of these conditions on the grounds was not severe. The dry summer promoted the formation of many flower buds in the dogwoods, which produced an outstanding display in the spring. Some branch damage can be attributed to the summer dry spell, while during the winter, rabbit and mouse damage to trunks and stems of smaller shrubs was heavy under the deep snow cover.

A major improvement on the grounds is now under way. The construction of the first segment of a roadway to the top of Peters' Hill, mentioned in the report of the previous year, is a costly operation, and it was expected that completion might be delayed several years. The Department of Parks and Recreation, however, recognized the need for this road and turn-around, and, with its cooperation, continuation of the work during this fiscal year has been possible, with completion scheduled for this summer.

In the care of the living collections a particular effort was concentrated on the area near the Forest Hills gate. Dieback of the *Prunus* collection necessitated the removal of many of the older plants, which now have been replaced with dogwoods to allow a period of rest for the soil. Newer accessions of cherries or propagations from the older plants are being placed elsewhere on the grounds in an effort to limit the effect of virus and nematodes. Portions of the shrub collection have also been replanted. Experience has shown that this area near the Forest Hills gate collects cold air during the winter season and that many Leguminosae have been affected by the colder environment. These have been moved to other



"Winter Splendor." The result of a February snow storm in the Arnold Arboretum. Photo. courtesy of the Boston Globe.

locations, while a miscellany of shrubs is being planted experimentally to determine family or generic hardiness in that particular spot.

Because of the dry fall, planting was held to a minimum, but the early, cool spring offered an extended period for moving plants from the Case Estates to Jamaica Plain. A total of 558 plants, representing 250 taxa, was planted. Included in this number were 34 taxa of *Salix* for improvement of the collection in the meadow area.

It has been possible to continue use of cocoa shells for mulch, and approximately 566 tons were used during the year, with particular success under various tree collections. A "mulching material" being used around small-stemmed plants is sheeting of black polyethylene film, the effectiveness of which was described by Dr. Wyman in a recent issue of *Arnoldia*.

Faulty drainage caused by an underlying layer of compacted soil necessitated special work on two nursery beds in the area of the Dana Greenhouses. After the top soil was removed and a hardpan layer broken, drainage tile was installed and covered with ten inches of sand and gravel. An enriched top soil was replaced and left over the winter, apparently completely correcting the problem.

The regular activities of the greenhouse staff were carried on as usual, or increased in certain directions. During the past fiscal year the Arboretum received 153 shipments of whole plants of 731 taxa from 12 countries, including the United States, and 159 shipments of seeds of 485 taxa from 43 different countries. The increase in these figures this year reflects the travels of many staff members who sent back plant materials or requested additional materials seen on their travels for study or horticultural trial. On the other hand, the Arboretum sent in response to specific requests, or for its own research purposes, 159 shipments of plants of 969 taxa to 7 countries and 56 shipments of 172 taxa of seeds to 13 countries. Included in the shipments of living plants were specimens of selected taxa considered worthy of more extensive growth. Under the program for cooperating nurserymen the Arboretum distributed eight taxa to 57 nurseries and botanical gardens, or a total of 549 plants. One of these, *Hamamelis intermedia* 'Arnold Promise', represented a new selection developed on the Arboretum grounds and reported in detail in a recent issue of *Arnoldia*. Six of the remaining seven taxa were plants recently or originally introduced to the United States by the Arnold Arboretum. All have been tested for hardiness in Weston and have proven to be most desirable cultivated plants not otherwise available in the United States. Also, 266 taxa were propagated for eventual use on the grounds in Jamaica Plain or in Weston; and 186 taxa were propagated for the use of the staff.

Previously reported research projects of the greenhouse staff are continuing. Among the projects newly initiated during the year is a study concerned with the processing of seeds of second generation hybrids of *Rhododendron* proven hardy at a temperature of minus 45 degrees Fahrenheit. Seeds for this project were donated by Mr. Frank Abbott, of Saxons River, Vermont. Another new project concerned study of progeny from seed of abnormal growth forms, or witches' brooms, of pine and hemlock. Seed from cones of these abnormalities produce both normal and abnormal seedlings which are now being studied to determine whether the abnormalities are lost or whether they may become lethal.

At the annual meeting of the American Association of Botanical Gardens and Arboretums in St. Louis, the Arnold Arboretum was reappointed for the third time national registration authority for woody plants not already represented by designated individuals or societies. During the past year

one registration list was published, for *Fagus*; work continues toward the completion of lists for *Ulmus* and *Weigela* within the calendar year.

Dr. Dudley has continued his work on *Alyssum*, chiefly on floristic studies, but has initiated, also, hardiness trials of more than 40 species, in order to determine the full potential of this genus as a cultivated plant for New England.

Mr. Green has organized the collections made on his trip to the Pacific. The new collections and data on various Oleaceae are being studied. A few of the recent introductions of the family formerly under plant quarantine restrictions have been cleared and will be distributed to other areas for trial.

Case Estates:

The interest in the plantings on the Case Estates in Weston continued to increase during the year. Past publicity and the maturity of some of the special collections have increased the educational value and the effectiveness of the displays. Additions were made to the trial plots of *Narcissus* and to the collection of *Lilium*. There are now more than 300 taxa of lilies, including one special gift of 52. In August, the New England section of the North American Lily Society made a special visit to the demonstration area. Additional beds have been prepared for display collections of *Hemerocallis*, *Iris*, and *Allium*, in the hope of developing a representation of the units of classification of each group, both for study by classes and for exhibition. The American Hemerocallis Society has offered material and financial support for work on those plants in which its members have special interest.

The perennial garden and the ground covers have had the majority of old labels replaced with engraved plastic labels.

Roads at 84–86 Wellesley Street were resurfaced in accordance with obligations to maintain access to this property, and one section was relocated for easier maintenance in winter snows.

A commercial survey of property lines along the Ash Street section was necessary following a petition by a neighboring property owner for construction at variance with town regulations. The boundaries of the Case Estates in this area, where 86 cultivars of *Chaenomeles* obtained in connection with the work of Dr. Weber have been planted, are now marked.

An open house was held on May 10.

Herbarium:

The most conspicuous changes in the herbarium were made in the facilities for housing and studying cultivated plants in the Administration Building in Jamaica Plain. Forty-three new herbarium cases were purchased and installed on the second floor gallery, doubling the case capacity of the herbarium in the past three years. This entire section of the herbarium has been redecorated and new fluorescent lighting has been installed. The third floor gallery has also been thoroughly cleaned and painted, and the unmounted collections stored there have been re-examined

for study, mounting, and insertion in the general herbarium as soon as possible, in order to make them available to the scientific community. The entire horticultural herbarium has been redistributed in the cases now available, both to increase working space and to allow for more rapid insertion of specimens.

During the year 21,951 specimens were mounted and added to the herbarium collections in Jamaica Plain and Cambridge. The total number of sheets in the herbarium is now 785,660. During the year, 14,931 specimens were received, the greater portion by exchange. The areas represented in order of size were India, Papuasias, the West Indies, and Western Malaysia. A large collection was received from the Royal Botanic Garden in Edinburgh, comprising the collections of G. H. Cave from the mountainous areas of India. This is a particularly valuable addition to our Asiatic collections.

During the past year, staff members and students requested or received for identification 6,219 herbarium sheets representing 81 loans from 40 institutions, 23 in the New World, 17 in the Old World. The staff filled loan requests for 141 loans to 67 institutions (41 in the United States and 26 foreign), and sent out 14,617 specimens.

The taxonomists of the staff have continued and intensified their research studies, partly as a result of recent field work on special groups. Dr. George K. Brizicky, who has completed work on the Celastrales and Sapindales for the generic flora of the southeastern United States, has ready for publication a study of the genera of Rhamnaceae of the same region, and is now studying the genera of Vitaceae. Dr. T. R. Dudley is continuing studies of *Alyssum* and its relatives, of the family Cruciferae, particularly the representatives from Turkey and adjacent areas. Dr. Shirley A. Graham has completed treatments of the Lythraceae, Elaeagnaceae, Rhizophoraceae, and Combretaceae for the generic flora of the southeastern United States, and is continuing work on the Polygonaceae and Araliaceae for the same project, as well as studies on the genus *Cuphea*.

Mr. Peter Green's work has been augmented by his new Pacific collections of Oleaceae which will provide material basic for solving some of the numerous problems in that family. Dr. Howard is continuing taxonomic studies on various West Indian genera, toward completion of a flora of the region. Dr. Hu is continuing studies in the genus *Ilex* and on other problems in the Asiatic flora. Dr. Nevling is carrying on his studies in the Thymelaeaceae, a family in which many genera are poorly understood because of inadequate material. Dr. Schubert is continuing studies in the genera *Dioscorea*, *Desmodium*, and *Begonia*, material of which was collected in Mexico in the autumn. A collection of about 100 specimens of *Desmodium* was received during the year from the Department of Agronomy and Soil Science of the University of Hawaii, consisting of voucher material for chromosome counts of *Desmodium* species being grown in breeding programs for development of forage and for other uses.

Dr. Wood has continued his supervision and editing of the botanical studies and illustrations for the generic flora of the southeastern United

States for which he is also preparing treatments of Gentianaceae and Loganiaceae and a comprehensive glossary. Dr. Otto Solbrig, of the staff of the Gray Herbarium, contributed a treatment of the Tribes of Compositae for the Southeastern Flora Project, and Dr. Wallace Ernst, formerly attached to the same project, completed studies on the Berberidaceae, Lardizabalaceae, and Menispermaceae, which were published during the year.

Dr. Claude Weber, a former graduate student, whose work on *Chaenomeles* has already been mentioned, completed the taxonomic and morphological portions of her work which are in the process of publication.

Library:

The task of maintaining a highly specialized library so that current needs are met and gaps in older literature are filled, is a demanding one. Thanks to the acuity and energy of Mrs. Schwarten, however, our library continues in its superior position. Two of the interesting rare volumes added in the past year are the *Curioser Botanicus* of Samuel Mueller, published in Dresden and Leipzig, in 1730, a notable addition to the pre-Linnaean collection, and not known to be in any other library in the United States; and a first edition of John Lindley's *The Vegetable Kingdom*, which completes our series of this work.

Three hundred forty-five bound volumes, obtained by purchase, exchange, or as gifts were added to the library during the year. Of these, one hundred concerning horticultural subjects are housed in Jamaica Plain. The total number of bound volumes is now 52,217. Three hundred eighty pamphlets and reprints increased the total of that collection to 19,824. The 1500 cards of the 1963-64 issues of the *Index to American Botanical Literature* published by the Torrey Botanical Club, 3000 cards of the *Card Index of American Plants* issued by the Gray Herbarium, and sets 18 and 19 of the *Index Genericorum* were all added to existing files in Jamaica Plain and in Cambridge.

In a joint project with the library of the Gray Herbarium the microfiche reproductions of the historical botanical collections of various herbaria are purchased and housed in the library for maximum protection. During the year microfiche reproductions of the basic herbarium at the Botanical Museum and Herbarium at Copenhagen, Denmark, were made available, along with those of some of the special herbaria of that institution (among them the collections of Isert and Thonning, Vahl, Forskål and Rottböll). The microfiche reproductions have great value in taxonomic research, and continuation of this project will be most desirable.

We are always grateful for the donations of books, manuscripts, and biographical materials to the library, and acknowledge with pleasure the useful gifts during the year from Mrs. R. W. Bliss and Mrs. E. Corning.

Comparative Morphology:

In continuation of his studies on the comparative anatomy of the leaf-bearing Cactaceae, Professor I. W. Bailey has found, in the genus *Pereskia*,

that the characters of cuticle, epidermis, and stomata of leaves and young stems prior to periderm formation offer significant evidence for the differentiation of taxa in *Pereskia*, as well as for distinguishing *Pereskia* from other genera. In a study of the occurrence of crystals in the leaves of Cactaceae his studies indicate that two morphological and biochemical categories of crystals are present. Further detailed investigation is called for which may elucidate the evolutionary changes in metabolism essential for the survival of these plants in arid environments.

Dr. Lalit Srivastava completed a review article on the anatomy, chemistry, and physiology of bark which will be published in the *International Review of Forestry Research*. In addition, he has surveyed the distribution of lignin in the bark of numerous angiosperms and gymnosperms. This work will be extended to determine the site of lignin synthesis and the possible relationships of synthesis of lignin and other phenolic compounds. Dr. Srivastava is engaged also, in an electron microscope study of living cells in leaves and bark to determine the changes in cell protoplast during the period of frost hardness.

Dr. Howard has expanded his examination of the nodal structure and the vascular anatomy of the petiole to additional plant families. The abundance of material accumulated during field work in Africa, Mauritius, Australia, and New Guinea has added 15 families and over 400 genera to the survey. A new nodal-petiolar pattern has been found in the Crassulaceae and a general occurrence of the type no. 4 nodal structure, accompanied by a unique vascular pattern, has been found in Zygophyllaceae.

During the year additions to the slide collection included many prepared from woods collected by Dr. A. C. Smith in the Fiji Islands. Slides of the Passifloraceae have been obtained in a program of exchange with the United States National Museum. A program of exchange of documented wood samples has begun with the Forest Products Research Institute, Laguna, The Philippines. A large number of samples of woods from Borneo was received from the Forestry Department in Sandakan.

Cytology and Genetics:

Dr. Mary Sanders has completed a survey paper on artificial culture of embryos. She reports on her continuing work on the cytology and genetics of sorghum that a search is being made for cytological evidence to support the hypothesis, developed from genetic evidence, that colchicine-induced mutants result from chromosome changes. Chromosomes are being examined in the parent line, in six mutant lines, and in reciprocal F_1 hybrids between parent and each mutant line. An investigation of colchicine treatment of four tetraploid sorghum lines, and of their corresponding diploid lines, also is in progress, in which diploid mutants have been obtained from both tetraploid and diploid seedlings.

Mrs. L. Rudenberg, Research Associate of the Gray Herbarium, has developed an interest in verifying cytological counts for plants in the living collections of the Arnold Arboretum. Regrettably, much of the early work published on chromosome counts of cultivated plants in the Arbo-

retum was not documented. Mrs. Rudenberg's present work involves plants under taxonomic study, such as *Psychotria*, or those soon to be studied. Chromosome numbers and cytological peculiarities are noted, with annotations made on herbarium vouchers and on the master locator cards in the Arboretum files.

A portion of Dr. Nevling's investigations of *Daphnopsis* species is also devoted to cytological studies which, up to now, have been inadequate for many representatives of this family. During the past year the first counts were published for species of *Daphnopsis* obtained as part of the field program in Puerto Rico last year.

Education:

No formal courses were offered by the Arboretum staff members during the year, but Messrs. Green, Howard, and Wood took part in presenting Biology 247, a course in plant geography. Graduate, undergraduate, and special students were assigned to staff members during the year for supervision of special research projects. These involved such diverse investigations as a review of the species of *Hopea* in the Philippine Islands, preparation of a check list of the cultivated plants of St. Croix, and study of the origin of homostylous pollen-trimorphic plants of *Psychotria guadalupensis*.

The informal Fall and Spring Field courses conducted by Dr. Wyman, Dr. Dudley, and Mr. Green in Jamaica Plain and Weston were well attended. Mr. Fordham again conducted a course in plant propagation using the facilities of the greenhouses. Dr. Howard, assisted by Dr. Wood, conducted a course in economic botany which considered the food plants offered by restaurants in the Boston area, for a selected group of dieticians. The full staff participated in taxonomic seminars held in the Harvard University Herbarium in Cambridge.

Staff members attended scientific meetings associated with their special research interests. Dr. Howard and Mr. Fordham presented papers during the regional meetings of the American Society of Horticultural Sciences held in Cambridge. Mr. Fordham was a speaker at the annual meeting of the Tennessee Nurserymen's Association, at the meetings of the International Plant Propagators Society in St. Louis, Missouri, and for the short course of the Connecticut Nurserymen at Storrs, Connecticut. Dr. Wyman was the speaker at the Awards Banquet of the American Horticultural Society in St. Louis, and at the annual meeting of the Garden Club Federation of Massachusetts. Dr. Howard gave the Laura L. Barnes lecture for the Morris Arboretum in Philadelphia, spoke in the lecture series of the Royal Canadian Academy in Toronto, and to the New York Horticultural Society. During his Australian trip he was invited to speak to the western section of the Australian and New Zealand Association for the Advancement of Science, in Perth. Messrs. Dudley, Green, and Howard were all speakers for the Boston Horticultural Club.

Dr. Schubert served as chairman of a section of contributed papers and presented a paper on *Desmodium* at the Second Mexican Botanical Congress.



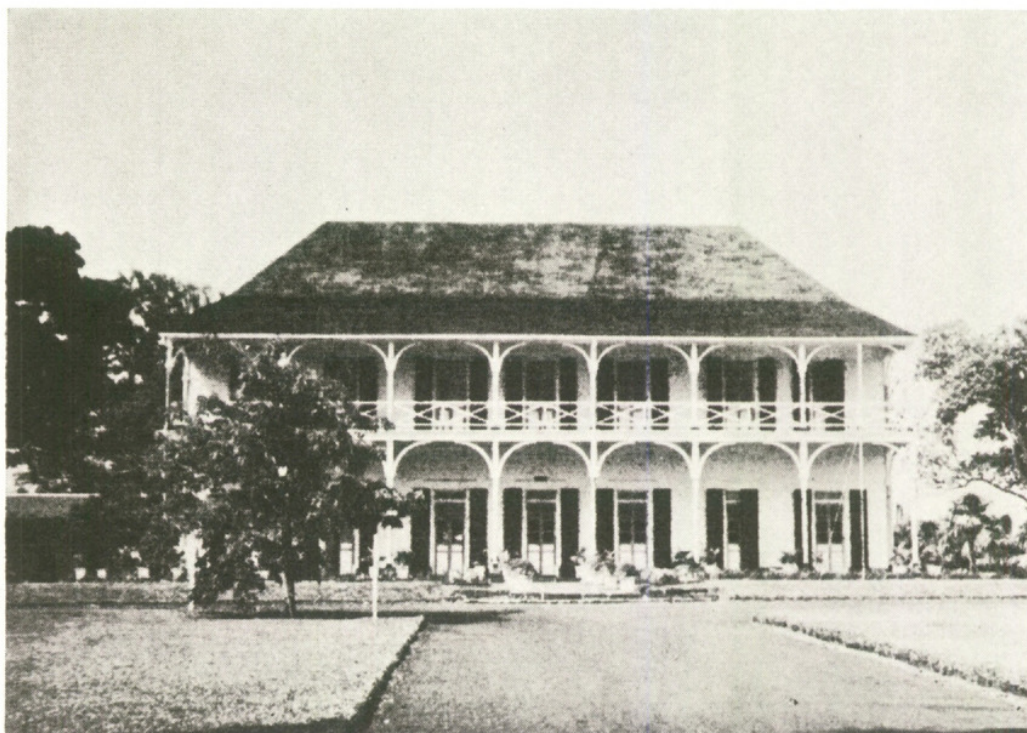
An exhibit of the Arnold Arboretum, in cooperation with the Horticultural Committee of the Garden Club of America, at the International Flower Show in New York. Photo. by J. Hugelmeyer.

Dr. Wood was invited to speak on modern distributional patterns in seed plants in a symposium on "The Origin and Evolution of the Biota of the Southeastern United States," during the annual meeting of the Society for the Study of Evolution held at the University of North Carolina, Chapel Hill, North Carolina.

These, and many other talks given by members of the staff, at the Arboretum or in other locations, form an important part of the educational contribution of the Arnold Arboretum. The preparation of mimeographed leaflets for distribution by the Garden Club of America represents another aspect of the educational program.

Exhibits and Displays:

Two large exhibits were prepared by the staff during the year. An exhibit on the propagation of woody plants by seeds was prepared at the request of the Horticultural Committee of the Garden Club of America for the International Flower Show in New York. This was similar to the exhibit last year at the Boston Flower Show, and was awarded the Director's Trophy. The staff prepared for the Boston Spring Flower Show of the Massachusetts Horticultural Society, in Boston, "an exhibition of mulching materials." A garden using different kinds of mulching materials formed the background for a display of wooden bowls containing samples



Top: Administration building of the Royal Botanical Garden, Pamplemousses, Mauritius. A garden visited by Dr. Howard for its importance in the transfer of economic plants from the East Indies to the West Indies.

Bottom: The exhibit of mulching materials presented by the Arnold Arboretum at the Spring Flower Show of the Massachusetts Horticultural Society, 1964.

of the materials at close range for visitors' viewing. This exhibit was awarded a gold medal and an educational certificate.

Travel and Exploration:

The opportunity to observe, collect, and study plants in the field and under cultivation is both a privilege and a requirement for the botanist. During the past year staff members of the Arboretum worked close to the Arboretum and in distant countries. From their efforts have come specimens dried as herbarium material, preserved for anatomical or cytological studies, photographed for teaching and lecturing, as well as living material for growing in greenhouse or out-of-doors for scientific study and for horticultural application.

Dr. Dudley undertook the task of adding to the representation of cultivated plants in the herbarium. We appreciate the kindness of owners of private gardens who gave permission for the preparation of herbarium specimens from their cultivated plants in localities at Mt. Desert Island, Maine, Chatham, Cape Cod, Massachusetts, near Albany, New York, and Philadelphia, Pennsylvania. Specimens of representative holly cultivars were also made available after the meeting of the Holly Society of America at the Callaway Gardens, Georgia.

Mr. Green, with the partial support of a grant from the National Science Foundation, made a trip to the Pacific to study plants of the Oleaceae and to make general collections in a few areas. His itinerary included the Hawaiian Islands, northern and western Fiji, New Caledonia, the north island of New Zealand, Norfolk Island, New South Wales, Victoria and Western Australia, and Lord Howe Islands. His collections from Norfolk and Lord Howe Islands were nearly all new to American herbaria and those of New Caledonia only slightly less so. Collections of certain families were made for specialists; and cuttings and seeds of Oleaceae and special groups for further study, or for possible horticultural introduction, were sent to the Arnold Arboretum, Foster Garden in Honolulu, the University of California Botanic Garden at Berkeley, the Los Angeles State & County Arboretum, Melbourne Botanic Garden, and the Royal Botanic Gardens at Kew and Edinburgh. Cytological collections made for Dr. Barbara Briggs of Sydney have yielded chromosome counts for 12 species in five genera of the Oleaceae not previously reported and a count for the puzzling genus *Oceanopapaver*. Dr. Otto Solbrig obtained clear counts from *Sciaphila* buds from New Caledonia, in a family which is scarcely known cytologically.

Dr. Howard spent two and a half months in the autumn on a trip around the world. He attended the plenary sessions of the AETFAT (a society devoted to the study of African botany) in Genoa, and then with most helpful assistance of botanists in many areas, was able to visit gardens and herbaria in Egypt, Ethiopia, Kenya, Mauritius, many parts of Australia, New Guinea, and Fiji. The initiative for the trip was an invitation to take part in a botanical tour commemorating the 50th anniversary of the founding of the Kirstenbosch Botanical Garden and the Natural History



TOP: LORD HOWE ISLAND; looking southeast from near Malabar towards Mt. Lidgbird (2547 ft. alt., left) and Mt. Gower (2833 ft. alt., right).

BOTTOM: *HIBISCUS INSULARIS* Endl. on Philip's Island (near Norfolk Island) where it is endemic, and of which only four bushes remain. Seed and cuttings were obtained.

Society of South Africa. After meetings in Capetown and local tours to places of botanical interest, the group of 41 visiting botanists representing 21 countries was taken on a 5,000 mile, 30-day tour of South Africa. As a botanical and horticultural introduction to the local vegetation and to the many introduced plants the tour could not have been better planned. Dr. Howard photographed many plant families and genera not usually available for use in classes, and also collected seeds, cuttings, and morphological material for further study.



Visiting botanists at the Kirstenbosch Golden Jubilee, September-October, 1963.

In April Dr. Howard, with Mr. Draper made a short trip to Puerto Rico to establish a small test garden for research purposes on land offered to the Arnold Arboretum on the south side of the Luquillo Mountain range.

Dr. Hu studied *Ilex* collections at the National Arboretum in Washington, and in several nurseries in Maryland. She also examined collections of the Meserve Arboretum on Long Island, in May, and obtained materials of hybrid plants for the horticultural herbarium.

Dr. Nevling represented the Arnold Arboretum at the dedication of the new herbarium facilities at Michigan State University in East Lansing. At a symposium held then, concerned with the role of "The Herbarium in the Modern University," curators from many institutions had the opportunity for discussion of professional problems.



Some botanists on Mt. Richmond, Victoria, Australia. Left to right: Clifford Beaglehole, Dr. Richard T. M. Pescott, Dr. James Willis, Fred Davies, Noel Learmont. Photo. by R. A. Howard, guest of this field party.

Dr. Schubert spent five weeks after the Mexican Botanical Congress collecting in the states of San Luis Potosi, Jalisco, and Nayarit, Mexico, and a week studying in the herbarium of the National University of Mexico in Mexico City. The cooperation of the botanists of the Botanical Garden of the National University and of the Forestry Department of the Mexican Government greatly expedited her work.

Gifts and Grants:

The Arboretum has gifts of many kinds in support of its work. The help of the Friends of the Arnold Arboretum which has been most generous is gratefully acknowledged. Herbarium specimens of particular interest were received from the Department of Agriculture in Bermuda and from the agricultural station of St. Croix. Books and back numbers of journals have been useful in filling some gaps in the library and in making available useful second copies for the use of the staff.

Various nurseries have made gifts of cultivated plants not represented in our living collections. The American Hemerocallis Society is supplying cultivars of daylilies for a collection in Weston, along with the funds for their maintenance. Mrs. F. W. Warburton of the Median Iris Society is contributing a collection of iris taxa for display. The Jan de Graf Company is helping to complete the representation of lily taxa in the collection in Weston.

Grants from the National Science Foundation helped to support the field



II Mexican Botanical Congress, San Luis Potosi, Mexico, September, 1963.

work of Mr. Peter Green in the southwest Pacific; support the investigations of Professor Bailey, and contribute to the support of the Southeastern Flora Project conducted by Dr. C. E. Wood. Grants for travel to the X International Botanical Congress were received by Dr. S. Y. Hu and Mr. P. Green.

Publications:

Under the editorship of Dr. Bernice G. Schubert four issues of the *Journal of the Arnold Arboretum* (now in its 45th volume) were published during the fiscal year, containing 515 pages and 23 articles, 21 of which were by members of the staff or former students. Dr. Wyman served as editor of *Arnoldia* (in its 24th volume) which appears at irregular intervals. Sixty pages were issued during the year.

In commemoration of the founding of the oldest botanical garden in the West Indies, on the island of St. Vincent, in 1765, the Arnold Arboretum is issuing a photocopy reproduction of the Rev. Lansdown Guilding's catalogue of the garden, originally published in 1825. Copies of the reproduction will be made available for the celebration on St. Vincent, and to libraries as well.

Another special publication is a photocopy reproduction of Dr. Donald Wyman's *How to Form an Arboretum*, of which a revised version was published as a number of *Arnoldia* in 1960.

The bibliography which follows lists 67 articles and books by members of the staff which were published during the past fiscal year.

Bibliography of the Published Writings of the Staff and Students

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RICHARD A. HOWARD, *Director*

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1963-1964

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** Resigned 1964.

*** Retired 1 January 1964.



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