The ARNOLD ARBORETUM of HARVARD UNIVERSITY

Annual Report 1951-1952

TO THE PROVOST OF THE UNIVERSITY:

SIR,

As a result of the trip the horticulturist made to Europe last spring, nearly 500 species and varieties of woody plants have been received from various places visited by him. Some of these are new to horticulture in North America, others are new to the collections of the Arnold Arboretum, and some, not new, have disappeared from our collections at some previous time. One of the interesting shipments was of 32 varieties of Ribes, Philadelphus, Deutzia and Weigela from the Proeftuin te Boskoop, Holland. These clones represent what the Dutch have finally agreed on as the true named clone for these varieties. They will be grown here and checked with what we have to see if they agree. During the spring approximately 255 species and varieties have been added to the living collections at the Arboretum. This includes a spring planting list of 384 plants. Also a substantial beginning has been made towards the replanting of Peters Hill, of about 55 different varieties of crab apples which were planted there this spring as the forerunner to making this an enlarged crab apple planting, 17 of them Dr. Sax's new hybrids. A three-hundred foot wisteria arbor was erected from white cedar wood this last winter, adjacent to the shrub collection and along the Arborway wall. This was made necessary by the increased land requirements of the Bussey Institution, on whose land the wisteria arbor was formerly located. The collections of the Arboretum are now recorded on 106 maps. Of these 40 were rechecked last year and 18 were redrawn. Approximately 900 display labels were made and 600 machine labels were made. Over 1,000 black and white photographs were taken, developed and enlarged to prints 5" x 7". This includes about 800 taken by the horticulturist in Europe. The remainder were taken by Mr. Howard, who also was responsible for the developing and printing of the entire lot. He also made several hundred postcards, pictures of valued specimens here in the Arboretum. About 300 color pictures were taken by Mr. Howard and about 800 by the horticulturist in Europe, all of which have increased our files materially. Two very beautiful display cases have been made and equipped with fluorescent lighting to show large Ektachrome transparencies of interesting Arboretum scenes. All the pictures for these cases were taken by Mr. Howard. Each case has 20-25 large color pictures and it is hoped two more cases will be made in order to illustrate the four seasons in the Arnold Arboretum. Such a display is ideal for showing "out of season" visitors some of the beauties of the Arboretum when the plants are at their best. During the fiscal year 328 shipments of plant materials, including 982 species and varieties, have been sent to cooperating institutions or

individuals in sixteen countries. The Arboretum received 1,194 species and varieties. Most of these were obtained from England and Holland as the result of Dr. Wyman's trip to Europe last year. Many were also received as seeds from Argentina and Japan. A total of 2,857 plants were successfully propagated; 153 by air layering, 9,906 by cuttings, 2,447 by grafting or budding. Well over 600 different numbers or pans of seed were sown. The regular number of bulletins have been published. The one on air layering has created wide interest. A resume of this work was also published in the *Journal of the Royal Horticultural Society*. "Trees for American Gardens," written by the horticulturist, was published by Macmillan and Company of New York in November, 1951.

Mr. Richard Fillmore left the Arboretum for a more lucrative position in commercial work, and was succeeded by Mr. Lewis Lipp as chief propagator. One of Mr. Lipp's first steps was to invite members of the Federated Garden Clubs to assist in the propagation work and to learn more about the various methods of propagation. The response was gratifying, and the program is off to a good start. A small tree demonstration plot was started last year and now contains 60 different kinds of small trees. The object is to display here in this one area some of the better small trees which are generally known and unknown, so they can be closely compared for growth and habit one with the other. This has great educational value for street tree superintendents as well as those interested in planting the home grounds. In the Ground Cover Demonstration Plot we now have growing 25 different kinds of ground covers. The two saran cloth houses again proved their worth during the dry summer of 1951. Plants grown in these, and hardened off properly in the early fall, seem to do far better than plants grown in the open nursery where water is difficult to obtain. Itis in one of these cloth houses that we have the 239 plants which are being grown under Post Entry Quarantine regulations with the permit from the U.S.D.A. Also in the same house are the majority of plants, cuttings and grafts which have been obtained from Europe this past winter. Much of the seed germination work of the Arboretum is being done this year as last at Weston.

Included in the plants being tried this year are seeds collected from certain specific places in northern Honshu, Japan, and also from the higher altitudes and colder, drier spots of Argentina. Some of these undoubtedly will not yield anything new or hardier, but, because they have been specifically collected in certain areas, some packets may yield plants of increased hardiness, and if this is the case it will make the entire project very worth while.

A young orchard of 38 *Malus sikkimensis* has been set out this year for the purpose of growing seeds of this rare crab apple to be used in the production of dwarfing understocks for commercial apple growers. Once the stock is widely distributed in this country, this group of trees will undoubtedly be discarded. Approximately 83 clones of the Glenn Dale Hybrid azaleas were growing in the saran cloth houses last summer, as a test for hardiness. Because of premature cold spells prior to November 1, 1951, all clones but about a dozen were actually killed, thus proving that these plants, on the whole, are not hardy here in New England. The production of polyploid plants often results in larger flowers and more sturdy growth. Dr. Sax

has found that when the artificially induced tetraploids are crossed with diploids, the resulting triploids are often even larger and more vigorous than the tetraploids. A new giant triploid Forsythia has been propagated for distribution, and has been named the "Farrand Forsythia" in honor of our consulting landscape gardener, Mrs. Beatrix Farrand.

Transgressive segregation in the second generation progeny of a Lonicera species hybrid has produced a promising compact low-growing bush honeysuckle. More hybrids have been obtained by crossing Malus Sargenti with other ornamental apple species. Most of these resemble the Sargent Crab in growth habit, but are more vigorous with larger flowers.

The progeny oftriploid Forsythia and Philadelphus have shown remarkable variation and some promising segregates. The use of tree lilac rootstocks as rootstocks for Syringavulgaris seems to be successful in producing a tree form of the common lilac. Dwarfing rootstocks to produce small ornamental trees are being developed for apples, hawthornes, peaches and plums.

In the Herbarium of the Arnold Arboretum, there are collections of many strange and aberrant genera from Northern Australia, New Guinea and adjacent areas northward into China and Japan. Professor Bailey's investigations of a succession of these genera in collaboration with Dr. A. C. Smith and others indicate that they are relics of an ancient, diversified, woody, dicotyledonous flora. A majority of them are characterized by their retention of relatively primitive internal structures. Intensive investigations of adequate collections of them promise to throw a flood of new light upon the morphological characteristics of ancestral dicotyledons and in time upon the great mystery of the origin of the flowering plants or angiosperms. During the year, Professor Bailey has made comprehensive studies of Calyptosepalum from Sumatra, Nouhuysia and Idenburgia from New Guinea, and a new relic tree collected by Dr. Smith in Fiji. Nouhuysia and Idenburgia prove to be congeneric, and Dr. Smith's plant appears to be closely related to Calyptosepalum, which clearly does not belong in the Santalaceae. Ing. Domingo Cozzo, a Guggenheim Fellow from Argentina, is spending a year in residence in order to work with material in the slide and wood collections.

Mr. Chi Ling Chen, a candidate for the doctorate, has initiated a comprehensive investigation of accumulated collections of the Sapotaceae. Professor Rhoda Garrison of Wellesley College is devoting a year to investigation of the structure and development of buds in Magnolia, Liriodendron, Akebia and Pterocarya.

During the year 6,274 specimens were mounted and inserted into the herbarium, making a total of 664,989 sheets. Incoming specimens totaled 16,236, over half of which (8,919) were received on the basis of exchange. Nearly 5,000 specimens were obtained by purchase or subsidy, and close to 2,500 were recorded as gifts. Of the total number, 6,797 specimens were Asiatic in origin, 5,906 came from the Pacific Islands and Australia, 1,020 represented European species, 563 were African, and only 1,850 originated in North America. The larger and more interesting incoming exchanges included 2,994 Malaysian specimens from

the British Museum, London, 1,714 Indonesian specimens from the Herbarium Bogoriense, Bogor (Java), and 944 Soviet specimens from the V. L. Komarov Botanical Institute of the Academy of Science, U.S.S.R., at Leningrad.

By purchase 1,287 Japanese specimens were obtained from Professor H. Haraof Tokyo. Outgoing specimens numbered 41,177, sent mostly as exchange to twenty-eight institutions. Of these, 5,306 specimens were sent to eleven American institutions and over 30,000 specimens to seventeen foreign institutions. Also, 5,257 mounted specimens were transferred to the Gray Herbarium.

Herbarium sheets totaling 3,756 specimens were loaned by the Arboretum to workers at twenty-three institutions. Of these, twenty-six loans comprising 3,531 specimens were sent to sixteen American institutions, while twelve loans totaling 225 specimens were sent to seven foreign institutions. The thirty-four incoming loans from fifteen institutions for study by our staff members totaled 3,245specimens. Of these, twenty-three loans totaling 2,882 specimens came from nine American institutions, and eleven loans totaling 363 specimens from six foreign institutions. A grant of $5,000 from the Guggenheim Foundation enabled Dr. Merrill to spend six months working in Europe. Most of his time was spent at the British Museum, where he selected for the Arboretum a large number of available duplicates of the Carr New Guinea collection. He also visited the herbaria at Kew, Edinburgh, Leiden, and Brussels, obtaining critical notes on i800types. At Brussels he studied various authentic Roxburgh specimens in the hitherto little-known collection of that author preserved in the Martius Herbarium. About fifty per cent of the approximately 1,350 specimens turned out to be isotypes. Also during the year he completed his manuscript, "William Jack's Genera and Species of Malaysian Plants. "Professor Johnston continued his work in the Asiatic Boraginaceae, completing his study of Lithospermum and its related genera. The pollen of the family was intensively studied and showed new and interesting characters which could be used in delimiting species. The last part of the year was spent working in the British herbaria. Dr. Kobuski continued his work on the Asiatic *Theaceae* and initiated work on Adinandra for the Flora Malesiana. Dr. Perry pursued her studies of the Papuasian flora, completing work on Elatostema and beginning the study of the *Euphorbiaceae*. Dr.Hu contributed two "Notes on the Flora of China," and continued her study of the genus Philadelphus. The library now has 48,098 bound volumes on its shelves, this represents an increase of 370 volumes; some were gifts, others were purchased or received in exchange for our publications. There were 197 pamphlets catalogued and filed; these were all gifts of the authors. Our pamphlet collection now numbers 15,064. Four-hundred-twenty catalogue cards were prepared, typed and filed in the main catalogue and 2,023 cards were added to the Gray Herbarium species cards. Many inquiries of a bibliographical or biographical nature were answered, as were many requests for photo stats, microfilms and photo prints. About I 100 photographs were added to the collection, these mainly photographs of plants growing in the Arboretum, but many were taken by our horticulturist on his European travels. Four-hundred-ninety-seven books were loaned to or borrowed from other libraries. With the gradual expansion of the Massachusetts Department of Public Health at the Bussey, it may be

necessary for the Arboretum to move its greenhouses, laboratory, cold frames and nursery plots to some other area. The Arboretum moved its greenhouses and propagating work to the Bussey grounds in 1927, because of the convenience to the Arboretum, adequate land for nursery work, and convenience of visitors who were interested in propagation and plant breeding work. No other area in or near the Arboretum could provide the advantages now enjoyed at the Bussey Institution.

KARL SAX, Director