The ARNOLD ARBORETUM of HARVARD UNIVERSITY

Annual Report 1943-1944

TO THE PRESIDENT OF THE UNIVERSITY:

SIR,

The regular income of the Arnold Arboretum was supplemented by a total of $9,293, received in the form of gifts from various individuals and as grants from several organizations interested in supporting research. A considerable part of this amount was for restricted purposes, including funds provided for covering the cost of publication and grants totaling $3,400 to support field work for a second season on the Alaska Military Highway. An American Philosophical Society grant of $600 from the Penrose Fund, supplemented by a similar grant from the Milton Fund of Harvard University, has enabled me to forward the work on the preparation of a comprehensive *Index Rafinesquianus* initiated several years ago. The institution operated well within its income for the year. There were, however, no additions to capital other than the annual accretions under the terms of gift to the James Arnold and Charles Sprague Sargent funds.

In the inter-unit transfers of reference material, 4,378 specimens and 412 illustrations with descriptions were transferred to the Gray Herbarium and the Ames Orchid Herbarium, while 3,164 were accessioned at the Arboretum by transfer from the Gray Herbarium. In addition, considerable number of specimens were mounted for the Gray Herbarium and returned to that institution.

The only change in the technical staff was the resignation of Dr. Hui-Lin Li at the end of October, 1943, to accept a Harrison post doctorate fellowship at the University of Pennsylvania. Continuation of leave of absence was granted to Dr. C. E. Kobuski, as he is still in military service. We have had some difficulties in the labor group, as several of our employees were drafted for military service, and others resigned to work in war industry plants. As a result, certain types of work in the grounds had to be deferred or greatly curtailed. It is probable that this unfavorable situation may continue for another year.

The situation in reference to instruction approximated that of the preceding year. There was a further reduction in the number of graduate students. As the accelerated instruction program still remains inforce, all restrictions limiting the amount of time staff members may devote to lecturing or supervising courses of instruction continue to be waived. It is felt that under emergency conditions all employees should cooperate as fully as possible in reference to the general instruction program of the University, in spite of the fact that under normal conditions their operations would be wholly or almost wholly in the research field.

A considerable amount of work has been done in checking the identifications of plants actually cultivated within the Arboretum grounds. The original objective was to grow as many different kinds of ligneous plants as were found to be adaptable to our not too favorable climatic conditions. This objective is still in force, but it is now felt that for the benefit of the horticultural public the time has arrived for a series of comparative studies to be made with the object of selecting and emphasizing the characters of the more outstanding horticultural forms in each major group, such as the lilacs, mock oranges, weigelas, roses, and others containing many ornamental species. The objective here is to determine and to list the preferable varieties by comparative selection from the very large number available. Thus in Philadelphus there are now actually in cultivation at the Arboretum 108 plants each with its special name. A careful study of this group at the time all were in flower reveals that only about 35 of them can be considered as worthy ornamentals. As studies of individual groups are completed the findings can be passed on to both the amateur and the professional groups. We can thus increase the service of the institution to American horticulture. During the year, 179 different kinds of plants were transferred from the nursery to the living collections, many of these being new to the permanent plantings. A total of 600 living plants, 18 lots of cuttings, and 22 packets of seeds were received, while 1,150 living plants, 65 lots of cuttings, and i6 packages of seeds were distributed.

The plantings have suffered, due in part to a shortage of labor and in part to the distinctly abnormal weather conditions. The past year was an exceedingly dry one, the rainfall deficiency approximating twelve inches. With little rain in November and December, and very little snow cover in the winter months, there was considerable injury to the root systems of various shrubs. The winter was mild, zero temperatures being experienced but once. However, injury to various trees and shrubs was manifest, probably because of the unusual winter dryness of the soil. The exceptional dry weather increased the fire hazard in the Arboretum during the fall and spring. The number of grass fires was unusually high, but most of these were of minor importance, although in two cases considerable damage was caused to the Chinese spruces on South Street and in the dwarf-conifer collection.

That the Arnold Arboretum strongly appeals to the general public is attested by the continued very large number of visitors, particularly at the height of the flowering season in May and early June. It is estimated that, in spite of transportation difficulties, there were at least fifty thousand pedestrians in the grounds on Lilac Sunday (May 21), and on the preceding Sunday, approximately thirty-five thousand.

Staff members have continued to render special services important in one way or another to the prosecution of the war. The investigations of the Harvard Camouflage Committee, on which staff members of the Arboretum served, were concluded with the preparation of a second restricted report on the use of tropical vegetation for camouflage purposes. The practicable and easily applied principles in reference to the selection of plant material for use in camouflage work was made widely available to the various camoufleur

schools of the United States Army. As a result of the publication and wide distribution of *Technical Manual 10-420*, "Emergency Food Plants and Poisonous Plants of the Islands of the Pacific," many inquiries have been received from servicemen stationed in the Orient and scattered from Assam and Upper Burma to New Caledonia.

A number of collections of botanical material have been received from the southwestern Pacific region, and so far it has been possible to report on each lot within a day after the specimens were received. Much assistance was given to the Navy Department in connection with the preparation of a restricted publication on "Native Woods for Construction Purposes in the Western Pacific Region." The preliminary lists of species were prepared here. Many data were supplied to the individuals concerned with the compilation of this useful publication, and all of the illustrations were made at the Arnold Arboretum. This institution is the only one in the United States that has comprehensive collections of specimens from New Guinea, the Solomon Islands, and neighboring island groups. Our extensive files of photographs representing scenery in New Guinea, the Solomon Islands, China, Japan, Formosa, and other active or potentially active areas in the Orient have been made available to representatives of the War and Navy Departments. Much assistance has been rendered to representatives of both departments by calling their attention to maps, illustrations, topographical, climatological, and other data incorporated in the technical botanical papers appertaining to Japan, the Bonin Islands, Formosa, the Philippines, the Netherlands East Indies, Papuasia, Micronesia, and Polynesia. The extensive bibliographic researches prosecuted in past years by our staff members on botanical publications appertaining to eastern Asia and the Pacific basin enabled us promptly to locate much needed information regarding specific areas. I have continued to lecture in the Army Medical School in Washington to each incoming group of trainees in the two months' intensive refresher courses on tropical medicine.

During the year I prepared a chapter on plant life for "The Pacific World," edited by Fairfield Osborn, President of the New York Zoological Society. The volume was published in June, 1944, and a very large special edition has been issued by the Infantry Journal for distribution to servicemen throughout the Orient. A series of individual volumes on various natural history subjects has been projected, and I have nearly completed the preparation of the text and illustrations of “Plant Life of the Pacific World," to be issued by the Macmillan Company, with a special edition for the benefit of servicemen to be published and distributed by the Infantry Journal in Washington. The idea behind the preparation and publication of this series of volumes is to supply specific information regarding various phases of natural history to individual servicemen, particularly those stationed on garrison duty.

The botanical survey of the Alaska Highway that was prosecuted in the summer of 1943, under the leadership of Dr. H. M. Raup, was so eminently successful that the military and other authorities expressed the desire that part of this new highway extending from Whitehorse to Fairbanks should be covered in a manner similar to the 1943 operations from Dawson Creek to Whitehorse. As a result, Dr. Raup organized another expedition, and his party left Boston at the

end of May, 1944, planning to be in the field until the early part of September. This year the party consists of Dr. and Mrs. H. M. Raup and their two sons, Dr. S. K. Harris of Boston University, Mr. John H. H. Sticht, glacial geologist, and Mr. Frederick Johnson, archaeologist. Our participation in the expedition was made possible by generous grants received from the Milton Fund of Harvard University, the Penrose Fund of the American Philosophical Society, the Joseph Henry Fund of the National Academy of Sciences, and the Society of Sigma Xi. In addition to funds received from these sources, Mr. Sticht received a grant of $900 from the American Geological Society, and Mr. Johnson a grant of $1000 from the Peabody Foundation, Andover Academy. The United States military authorities cooperated by providing transportation on the road and commissary privileges.

It was very fortunate that this institution was able to operate along the entire length of the Alaska Military Highway during two seasons. The road extends for approximately 1,500 miles, and much of the territory traversed by it was previously inaccessible. Thus the region had, in general, never been adequately explored from a botanical standpoint. A total of somewhat in excess of four thousand numbers was collected during the two seasons. The total number of specimens prepared approximates 28,000. It will now be Dr. Raup's task to study this material intensively and prepare a comprehensive report on the botany of the regions explored. The extensive series of duplicates will then be distributed to larger botanical institutions in this country, in Canada, and in Europe.

The plant breeding work, under the direction of Dr. Karl Sax, has resulted in a number of new hybrids, and various selections from these have been made for propagation and for further tests. The genera involve *Prunus, Malus*, and *Forsythia*. Further work has been done with the Persian lilacs and their hybrids, with a view to clearing up certain taxonomic problems. The work with *Syringa* continues.

In wood anatomy, Dr. I. W. Bailey has continued his investigations of the woody structure of the ranalian families, this work being done in cooperation with Dr. A. C. Smith, who is interested in certain taxonomic interpretations. The investigations regarding a half-dozen important genera are approaching completion.

The research projects of all staff members in the taxonomic field are largely continuations of investigations initiated in earlier years. The special fields in taxonomy involve Mexico and adjacent parts of Texas, northwestern Canada, various parts of the United States, Central America, the Southwest Pacific region, and Fiji. Those individual staff members specializing on specific groups have received much material for identification from other institutions and from individuals. On the whole, however, botanical field work has slackened during these war years. Yet it is interesting to note that a number of individuals in military service stationed in the southwest Pacific area are actually sending in botanical material for identification and report. An interesting innovation has been the completion by Dr. L. M. Perry of her translation of Dr. Lam's "Fragmenta Papuana" from the original Dutch into English. This is a very interesting account of his explorations on the Mamberamo River expedition in

Netherlands New Guinea in 1920 on a trip from the coast to the summit of the central mountain range, his party being in the field for a period of twelve months. In bibliography, work has been consistently prosecuted on Dr. Verdoorn's *Index Botanicorum* project. He has also edited and completed the extensive “Plants and Plant Science in Latin America" and "Science and Scientists in the Netherlands Indies." The work of Professor Alfred Rehder, retired, on the preparation of his comprehensive "*Bibliography of Cultivated Trees and Shrubs*" falls in the bibliographic project, and after four years' work, the manuscript is now approaching completion.

A total of 17,345 specimens was mounted during the year, of which 9,212 were distributed into the herbarium, the reference collections now totalling 617,944. From other institutions or from individuals 26,822 specimens were received, this material originating as exchanges, gifts, subsidies, purchases, or loans for identification. This material came largely from Mexico, China, Australia, Fiji, Belgian Congo, Philippines, and Borneo. The largest and most important accession during the year was approximately fifteen thousand specimens of Canadian plants collected by Dr. Raup and his party along the Alaska Military Highway.

In exchange or by transfer 11,745 specimens were sent to other institutions. The policy of transferring certain botanical material and mounted illustrations of herbaceous plants to the Gray Herbarium and of orchids to the Ames Orchid Herbarium at the Botanical Museum has been continued. Twenty-one loans, totalling, 1,066 specimens, were made to other institutions, and fifty loans, totalling 1,758 specimens, were received from fourteen institutions by members of our own staff.

Accessions to the library during the past fiscal year amounted to 250 bound volumes and 140 pamphlets, bringing the total of bound volumes to 45,563, and of pamphlets, 13,462. The normal number of cards and reference slips were added to the files. Inter-library loans continued to be very numerous, and many orders for photostats and microfilms were received. Approximately 3,600 volumes representing the various sets of professional forestry serials were deposited in the library of the Harvard Forest at Petersham, where this specialized literature will be available to individuals interested in forestry and forest problems.

A complete set of enlarged prints, approximating 16,000 in number, has been made from the microfilm representing the historical specimens in the Linnaean Herbarium, London. These prints, however, cannot be arranged in final order until we receive the new catalogue of the Linnaean Herbarium, which is now being prepared in London.

The usual numbers of the *Journal* and of *Arnoldia* were issued, and the fourth number of *Sargentia* appeared in September, 1943; the latter including papers by Mr. A. E. Porsild of the National Herbarium of Canada on the flora of the continental Northwest Territories of Canada, and by Dr. H.M. Raup on the willows of the Hudson Bay region and the Labrador Peninsula. A fifth number in this serial, now in press, is an English translation of Dr. Lam's "Fragmenta Papuana." The bibliography of papers published by staff members and students during the year

represents nearly 100 titles, many of them appearing in technical periodicals other than those published by the Arnold Arboretum. The complete list appears in the *Journal of the Arnold Arboretum*, vol. xxv, p. 497-500. 1944.

Atkins Institution of the Arnold Arboretum, Soledad, Cienfuegos, Cuba

The limitations mentioned last year still prevail in reference to this unit. Work has been concentrated on the maintenance and extension of the plantings at Soledad. Various difficulties have been encountered because of the impossibility of securing certain supplies, because of the extremely dry weather that has characterized the past two years, and because of the necessity of increasing wages. Difficulties were encountered in reference to the water supply for irrigation purposes, but a new source of supply has been developed within the limits of the garden, although this involved a rearrangement of the irrigation pipelines and the pumping installation. During the year, 195 living plants and 346 packages of seeds were distributed, while 20 living plants and 176 packages of seeds were received from abroad. For the second year, because of war conditions, no graduate students were available to take advantage of the facilities at this Cuban station.

E. D. MERRILL, Director