

COOPERATIVE PLANT EXPLORATION

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Longwood Gardens was the private country estate of Mr. Pierre S. du Pont until his death in 1954. At that time it came under the care of the Longwood Foundation, Inc., a non-profit philanthropic foundation, and today is beginning to become in some ways more like certain old-line arboreta and botanical gardens though it will always remain primarily a display garden.

When long-range plans and goals for the future of Longwood Gardens were being formulated, we wondered how the Gardens could initiate a plant introduction program which would benefit its own displays as well as ornamental horticulture elsewhere in the United States. The result was a cooperative program of plant exploration in which the parties concerned were Longwood Gardens and the U.S. Department of Agriculture. It seemed logical that, since the Federal Government through its New Crops Branch (USDA) already had the 'know-how,' the staff and facilities for plant exploration, Longwood should work cooperatively with it. Longwood Gardens would transfer sufficient funds each year to maintain a trained man in the field as a plant explorer but the actual field work would be supervised and conducted by the USDA.

To give you some background of the plant introduction activities of the United States Department of Agriculture, the cooperating agency, I might briefly describe a bit of its organization and work. Plant exploration and introduction activities are centered in the New Crops Research Branch of the Agricultural Research Service with headquarters at Beltsville, Maryland. The work of the Branch includes that of a Plant Introduction Section and a Crop Development Section. The Plant Introduction Section conducts all work involving the procurement or international exchange of plant material, its inspection and inventory. The Crop Development Section, on the other hand, conducts all work on the screening, maintenance, and development of plant material after it has been introduced.

There are four federal Plant Introduction Stations, located at Coconut Grove, Florida; Chico, California; Glenn Dale, Maryland; and Savannah, Georgia. These are primary centers for handling new plant introductions. In the course of making exhaustive tests on certain categories of material, large collections are built up and held for long periods. The Introduction Stations, therefore, constitute important reservoirs for plant germ-plasm which are thus made available, often over a long period, for breeding programs throughout the country.

In addition to these four federally operated stations there are four state-federal cooperative plant introduction stations located in each of the primary geographical regions of the country — Geneva, New York; Experiment, Georgia; Ames, Iowa and Pullman, Washington. Plant introductions to be tested under this program go directly from the Inspection House to a coordinator at one (or more) of these regional stations. It is quite obvious that, because of geographical locations, cer-

tain regions are better fitted to handle the increase and testing of specific crop items. At the end of each year, detailed seed or plant lists are assembled by each coordinator for distribution to all state experiment stations in his region. These lists indicate the materials which are available through these regional plant introduction stations. The existence of test locations such as these federal and state-federal introduction stations was, of course, one of the reasons for considering cooperative plant introduction with the federal government.

Since 1946 four cooperative explorations have been conducted under the Longwood Gardens — USDA program. The first was to southern Japan. The warmer parts of Japan were selected because it was felt there had been a great deal of effort made in the past to collect for the colder areas of the United States. Practically no attempt had been made to help the South, the Southeast, the Southwest or the Pacific Northwest. Therefore, our first explorations have been aimed to aid those areas.

The Japan exploration was conducted in 1956 by Dr. John L. Creech, USDA Horticulturist. Southern Japan is an area well supplied with broad-leaf evergreens. Many of the plants he collected should be of interest to comparable areas in this country.

Besides visiting wild areas for native plants, explorers also visit gardens, experiment stations and flower shows. Since Longwood maintains a fine display collection of chrysanthemums, we were particularly interested in any new types of these plants from Japan. Dr. Creech therefore visited chrysanthemum shows where over 200 clones were found and subsequently introduced. Some of them are quite unusual and have already entered into Longwood's Fall chrysanthemum displays.

The second Longwood-sponsored exploration investigated the ornamental horticultural centers of southern Europe where are to be found many plants which are little known in this country. Dr. F. G. Meyer, USDA botanist, was selected to conduct this work. His travels in 1957 covered Portugal, Spain, southern France and Great Britain.

The third exploration, conducted in 1958 by Dr. Llewelyn Williams, USDA botanist, focused on southern Brazil, an area rich in showy sub-tropical flowering trees, some of which are frost-tolerant. Such species should be very useful for Florida, Southern California, Hawaii and Puerto Rico. Longwood hopes to be able to grow representatives of such plants in her conservatories as dwarfed tub specimens.

A fourth cooperative exploration began in September, 1958. As a matter of fact, I had the pleasure of helping initiate this exploration in Australia which was undertaken by Mr. George H. Spalding, a horticulturist on loan to the USDA by the Los Angeles State and County Arboretum. Since I participated, if briefly, in this work, I would like to comment on this exploration, using it as a means of showing you how such sorties are organized and carried out.

Australia was considered important for a number of reasons. In the first place, little if any organized plant exploration has been done by Americans in this area. The reason for this is obvious. Australia is an English-speaking country. Australians are wonderful cooperators and they have sent hundreds of living plant materials to this country.

as contributions to our plant introduction program. However, as all of you know, this is not always the best way to conduct plant exploration. You don't always know actually the range of materials unless you see them in person. Sometimes what others feel are not worth much, may be just the thing you are looking for

If you put a map of Australia over the United States it would just about cover our land area. To cover an area the size of the United States in a period of four to six months is impossible and, therefore, an exploration of this type should be considered no more than a reconnaissance. It has, however, pin-pointed areas which may bear revisitations in the future

Australia is largely arid and most of the exploration was done on the eastern, southern and western margins where more adequate rainfall supports a richer flora than that to be found in the interior of the continent. Rainfall maps are of much importance to plant explorers. The rainfall pattern of Winter rains and dry Summers — Mediterranean climates — is typical of much of the Australian area explored. In this country, southern California has a similar rainfall pattern and plants introduced should do best, therefore, in that state. The other type of map important to a plant explorer is the temperature map. South of the Equator, July is the coldest month, so one must look to see what the limiting temperatures are in that month. Australia's climate is a warm one. Few areas have freezing temperatures which means that Australian introductions in general cannot be expected to be cold-tolerant.

Just a few words about Australian plants. The "down under" continent is unsurpassed, except perhaps by South Africa, for the wealth of its showy and unusual plants. Particularly noteworthy is the concentration of showy herbaceous and woody materials to be found in the state of Western Australia. Australia is most famous for the concentration of species in the two genera, *Acacia* and *Eucalyptus*. The acacias ("wattles" in Australia) number over 300 species. In this country we think of them usually as trees. There exists, however, a great variety of habit in the genus and the lesser known shrubby forms are especially showy. It is to be hoped that the introduction of some of the latter will add variety to the acacia species currently being grown in this country as ornamentals. With over 500 species, *Eucalyptus*, is equally intriguing. A number of the eucalyptus of Western Australia are very showy in flower. What appealed to me, however, was the beauty of the trunks, particularly in the *Eucalyptus* group known as "gums". Here the bark exfoliates somewhat like that of our paper birch or sycamore, leaving varying shades of contrasting color. Examples are barks that gray and white, yellow and green, or even pink and white. I would recommend that selection of eucalyptus for introductions as ornamentals be based not only on the more usual tree or shrub characteristics, but also on this unusual one of attractive bark coloration patterns as well.

In conclusion, I might suggest at this point that anyone particularly interested in the introduction of new plant materials of a special sort and difficult of introduction privately should contact the New Crops Research Branch. Certain of these requests might be able to be

handled in conjunction with planned explorations under this cooperative program. Recommendations should be directed to the Plant Introduction Section, New Crops Research Branch, Plant Industry Station, Beltsville, Maryland. Consideration can then be given by those concerned with planning these explorations. Additional explorations are already being scheduled. One to West Europe will be conducted in 1959, one to northern Japan in 1960, while a Madagascar exploration is tentatively planned for 1961. If you have particular ornamental items of interest from these areas, requests should be directed to the address just mentioned.

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MODERATOR BUCKLEY: I have been most inspired. I had no idea how far the United States was going in introducing new plant materials. The problem is going to be, of course, getting these plants established in other countries.

Now we have a moment or two for questions from the floor.

MR. DAVID LEACH (Brooksville, Pennsylvania): I would like to know if you found any rhododendrons growing in the Auckland area?

DR. HODGE: We didn't get to Auckland. We hope to arrange a plant exploration to New Zealand for I understand the rhododendrons in this area are beautiful to behold. I would say one of the things we were particularly looking for were some of the select rhododendrons which have been in special collections, such as the Javanese rhododendrons. These would be of no use outdoors except in the tropics, although there were some native ones in Northern Australia. Some forms of these will be selected through cooperation with some of the botanical gardens in Brisbane.

MR. HOOGENDOORN: Two years ago in July when I went to the Canadian Rockies I noticed what I thought were rhododendrons in bloom. Do you know what variety this might be?

DR. HODGE: I have no idea, but I think maybe Francis de Vos might be able to help.

MR. de VOS: It could very well have been *Rhododendron albiflorum*. It is a very unusual species.

MODERATOR BUCKLEY: I purposely left my talk until the last so we can get this session over on time. I don't intend to be too elaborate about my own paper.

Moderator Buckley then presented his paper on the "Dominion Arboretum" and "Noteworthy Woody Ornamentals." (Applause)

THE DOMINION ARBORETUM

A. R. BUCKLEY

Dominion Arboretum and Botanic Garden

Ottawa, Canada

In 1886 when plans were being made to establish the Central Experimental Farm at Ottawa, a piece of land 65 acres in extent was set aside for the development of an Arboretum and Botanic Garden. It was felt that such a garden would play a very important part in agri-