

World Vegetation in Relation to the Boyce Thompson Southwestern Arboretum

Dr. Homer L. Shantz

President, University of Arizona
Tucson Arizona

If the great physiographic divisions are exemplified, the earth's surface is more distinctly marked by the vegetation cover than by any other feature. The land area of the world amounts to about 52,000,000 square miles. Of this area, less than 25,000,000 square miles of forest and grassland are climatically suited to produce crops without irrigation. This more humid area may be divided on the basis of temperature into a tropical area covering about 12,800,000 square miles and a temperate area covering about 11,500,000 square miles. In this latter division, about 3,000,000 square miles are grassland, 7,600,000 square miles are coniferous forest land, and 6,500,000 square miles are deciduous forest land. This deciduous forest land, the home of our race until less than a century ago, is located in western Europe, eastern Asia, and the eastern part of the United States. In this area are located, with few exceptions, that botanical gardens and arboreta of the world. Climatically, these gardens are adapted to grow plants from only one-eighth or less than twelve percent of the land area of the world. Here are located such great botanical gardens as the Missouri Botanical Garden, the new National Arboretum at Washington, the Brooklyn Botanic Garden and hundreds of lesser gardens in the United States. The great gardens of Europe, such as the Kew Gardens of London, the Gardens of Berlin and Paris and many other European cities, are all located in the deciduous forest area. The restricted natural environment of these great gardens is supplemented by greenhouses in which many plants are grown under glass. Plants from the other seven-eighths of the world area are grown with great difficulty and often scarcely resemble the same species in its native habitat. In this deciduous forest area are concentrated the botanical gardens of the world, and, while there are none too many gardens in this area, the proportion in other parts of the world is lamentably small.

Half the land area of the world, or 26,000,000 square miles, characterized by desert savanna and desert shrubs, is too dry to produce ordinary crops and mesophytic plants without irrigation. This area is desert or semi-desert in character, where droughts are long and periods of rainfall short, where plants stand for months without water available for growth, and where water is the one and often the only limiting factor. Known as a desert country, there are here found many of the most beautiful plants in all the world and certainly many of the most interesting. Plant growth in the desert is limited in quantity but not variety. Here only those plants which have developed every possible protective device of growth habit, morphological structure, and physiological adjustment can succeed. The extreme conditions are met by a thousand different adjustments. This in itself would make the flora of the desert more interesting than any other type.

Realizing that half of the world's vegetation is of this type, the potentialities of such an arboretum we are dedicating today become evident. Here can be grown the plants of our own Southwest, much of Mexico, the desert regions of Chile and Patagonia, the Great Sandy, the Gibson, the great Victoria deserts of Australia, the Namib, the Big and Little Karroo, the Karroo Plateau and the Kalahari, the Sahara, the Libian Desert, the Nubian Desert, Somali Land, East African Deserts and the Deserts of Arabia, Persia, Turkestan, East Turkestan, and Mongolia. Here can be grown the wonderful varied forms of Cactaceae, a succulent group which is naturally at home in this section. Here also can be grown the equally interesting and varied Euphorbiaceae. A collection of each of these groups would be a notable achievement and probably no garden could be better located for this purpose. The Mesembryanthemums of South Africa would rank second in interest to no other group. Here could be collected most of the Acacias, of Africa, Asia, Australia, and America, a wonderful group judged either as ornamental, or as trees productive of gums, tannin, wood and forage; the Combretums, equally interesting and hardly known in our plantings; great groups such as the Yuccas, Agaves, Aloes, Cotyledons, and the various other succulents, not to mention the wealth of shrubbery and bulbous plants limited only to this dry country. Probably more species can be grown here at this Arboretum under natural conditions than under the same conditions in all of the gardens of eastern United States and Europe.

With the addition of a little irrigation, the scope may be extended over another 1,200,000 square miles of sclerophyll forest and brushland, the Mediterranean flora, the Cape flora, areas in Chile and Australia, and the southwestern part of the United States. The potentialities are entirely beyond the possibilities of realization, even if the Arboretum had limitless funds, but it may and should become one of the world's most noted gardens, for the physical plant is here, and the areas of exploration are great and interesting. Compare this opportunity with that afforded by the other arboreta of the world and realize that the area to be drawn upon is at least four times as great, the number of species probably far greater, and the extremes of adjustment and variety of form many times as great as any found in the humid climates. On a small area of the earth's surface, 6,500,000 square miles, we have concentrated most of our botanical and horticultural efforts, while half the world's area has been entirely neglected. It is from this on half of the world's area that we can draw plants for this Arboretum.

To Colonel Thompson belongs the distinction of having first met this need and appreciated this great opportunity, of having been the first to set aside an area for the collection and study of the plants which have morphologically and physiologically made the adjustments to extreme conditions. Surely no greater opportunity ever fell to the lot of any man. This Arboretum, wisely administered and adequately endowed, can contribute to the solution of the problems of the desert plants and to better understand their morphology and physiology. It should become a great center for the study of desert plants and desert problems from both the scientific and the practical sides. We have here an institution that will be visited and utilized by people all over the world. The opportunity is a great one, and the establishment of the Arboretum may well become one of the most important and worthwhile adventures in plant work undertaken during the last century.