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ANTISEPTIC VEGETATION FOR CUBA

BY

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ANTISEPTIC VEGETATION FOR CUBA

The word antiseptic is applied to vegetation planted for the purpose of killing germs, either in the ground or air, and combating the ravages of fever and disease. The late Baron Ferdinand von Müeller first made use of this word which so aptly describes the various genera of Myrtaceous vegetation now recognized as one of nature's great gifts to mankind. For over forty years he devoted his life to the classification of the flora of Australia, at that time almost unknown to the world, and he himself attributed the salubrity of the coast climate of Western Australia largely to the prevalence of Myrtaceous trees and shrubs. As yet it has hardly been definitely settled how this is accomplished; but recognizing the presence in these plants of volatile oil, the purification of the soil and air is probably accomplished partly by drying up unhealthy swamps, and possibly the roots directly feeding on the destructive germs contained in the soil, and partly by the diffusion of an antiseptic ether, deadly to these germs; partly also by the direct absorption and deodorizing action of the leaves. It is not, however, my intention here to enter into the chemistry of the oils of the *Melaleucas* or *Eucalyptus*, as little is at present known as to the former; and as regards the latter, much yet remains to be investigated, and also it is not yet definitely settled how this vegetation favorably affects climates.

Before proceeding directly to discuss the various plants recommended for trial, we would like to suggest the conditions we would have to meet in Cuba. The United States Government has already been making some inquiries, and I think it is especially timely for the Academy of Science of Southern California to collect and classify the information we have, especially as our President, Mr. Abbott Kinney, has written what is now the standard work on the successful introduction of the *Eucalyptus* (one great genus of antiseptic vegetation), and, with Mr. Elwood Cooper and other pioneers, has so widely distributed the various species that they now form one of the chief features of our Southern

California landscape. I am inclined, however, to believe the conditions which prevail in Cuba are somewhat unusual. At Havana harbor one of the great difficulties the late Colonel Waring (who so nobly gave up his life in investigating these conditions) had to contend with was the prevalence of marsh lands, over which the sewage of the city had to pass, and the exposure of these mud flats during low tide, and one of his recommendations provided for the draining and reclamation of these mud flats. And possibly, for the amelioration and improvement of health conditions in other parts of Cuba, the United States would have largely to deal with somewhat similar conditions. Assuming this to be somewhat the case, I have placed the genus *Melaleuca*, one branch of the great family of *Myrtaceae*, first on the list as worthy of trial, because some of the most useful species extend into tropical climates, and because, in the *Manuel de l'Acclimiteur*, by Charles Naudin and Baron Ferd. von Müeller, the standard work on plants adapted to the different climates of Europe and tropical countries, it is stated, in describing one species, that "This *Melaleuca* grows vigorously in earth impregnated with salt water where no *Eucalyptus* could live, and it does much to ameliorate the unhealthfulness of the climate. *This remarkable attribute* ought to recommend its culture in colonies established near marshes or lagoons in countries surrounding the Mediterranean Sea, principally in Algeria." He goes on to mention several other species which are equally valuable, and which I will refer to in detail.

The first to recommend will be the *Melaleuca leucadendron*. From the leaves of this and allied species or varieties is distilled the oil of cajeput, an essence generally green, with a somewhat agreeable and very penetrating odor, employed from time immemorial in Chinese India, externally and internally, for rheumatism, nervous affections, malignant fevers and cholera. A very nearly allied species, *Melaleuca virideflora* or *niaouli*, of New Caladonia, extends as far north as the Indian Archipelago. Besides oil and bark it furnishes the natives with building timber, and in utility is to this country what the *Eucalyptus* is to Australia. These various forms are sometimes united as only varieties of *Melaleuca leucadendron*, sometimes given specific rank.

Melaleuca minor, in Java and Molucca, also produces oil. *Melaleuca cajuputi*, long considered as only a form of *Melaleuca leucadendron*, is found in the Indian Islands as far west and north as the southeast coast of Borneo. It is in the islands of Borneo and Ceram where the two largest forms are found, and the leaves and bark are used by the natives. The tree stands out in the forest, having a white bark like birch bark. The

number of the closely allied species or forms, spreading from Western Australia from latitude 34° almost to the tropics, would justify a belief in its extreme adaptability to various conditions. I note the following description by J. H. Maiden: "It is called in Australia White Tea-tree, is a large, shapely, umbrageous tree, which has broad leaves and white or creamy flowers, and which is found in nearly pure sea sand, or by the side of brackish creeks." I have recently received a specimen of this tree growing in San Diego.

We have perhaps another form of it in our parks in Los Angeles. Among others recommended are *Melaleuca ericifolia*, making quite a tree; *Melaleuca linariifolia*, somewhat common in our parks in Los Angeles; *Melaleuca genistafolia*, all suitable for trial.

The genus *Melaleuca* comprises over one hundred species, many of them worthy of trial. Before leaving this attractive genus it may not be out of place to touch on the great beauty of many of them. Dr. Franceschi, an importer of new, useful and ornamental plants, tells me that at Naples this was almost the only plant used for decorating the summer villas erected on a promontory of land reaching out into the sea. Nothing else would withstand the direct sea breezes. Two specimen trees of this genus, *Melaleuca Huegeli*, nearly sixty feet high and the stem four feet in circumference, and *Melaleuca cuticularis*, is twenty feet high and nearly five feet in circumference, are well known trees in the Cape Town Botanical Garden. It may also be found that the *Callistemons*, a very nearly allied genus, may provide some trees worthy of trial. A tree of *Callistemon speciosus*, nearly twenty feet high, is one of the sights of Santa Barbara.

Before discussing the *Eucalyptus*, I would like briefly to refer to a few more genera which may be included under the head of antiseptic vegetation. *Leptospermum loevigatum*, also known as *Fabricia laevigata*, is well known in San Francisco from being largely used in reclaiming the sandy soil of the Golden Gate Park. It makes quite a tree, and with *Leptospermum lanigerum* is recommended by Charles Naudin, who says it is supposed to have the effect of driving away malaria from swampy places, and fulfills the same health giving role as *Melaleuca ericifolia* and many of the *Eucalypti*. *L. flavescens* extends as far north as the Philippines, and several other species extend to the Northern portion of Western Australia and are suitable for experiment. The leaves of *L. scoparium* were used infused as tea by Capt. Cook and his crew on his voyage of discovery.

Another genus belonging to the Myrtaceae, probably the most widely spread over the various islands of the Indian Archipelago

pelago and Oceanica, are the *Metrosideros* and *Xanthostemon*. Of the latter, twenty-five species are endemic to Australia, ten in New Caledonia, and one (*X. verdugonianus*) in Mindanac. Indeed, it is probable that several useful Myrtaceous plants might be introduced from the Philippines. The *Metrosideros* polymorpha, named on account of its varying types, forms the most generally prevailing trees on the Hawaiian Islands between 1500 and 5000 feet. *Metrosideros vera* is one of the iron woods of Molucca; *Syncarpia laurifolia*, now classed with the *Metrosideros*, is one of the most valuable shade trees of Australia. But, though all the dry capsular seeded forms of the Myrtaceae may prove valuable, I think enough has been suggested, and I will proceed to the discussion of the *Eucalyptus*, which undoubtedly, in the higher mountainous regions of Cuba, will be most successful; and some few species may prove valuable in the tropical lagoons near the coast.

With the consent of Mr. Abbott Kinney, the author of a work on the *Eucalyptus*, I make use of much of the data he has collected that directly applies to the introduction of this family of trees into tropical countries. Prof. Charles Naudin says:

"The introduction of the *Eucalyptus* into tropical countries has up to now been only moderately successful; more especially have they failed where the heat is almost uniform and the humidity of the atmosphere very great. Speaking generally, the *Eucalyptus* requires a season of rest, either by reason of a fall in the temperature or a prolonged dry season. There are, however, a few species which seem to have succeeded in the tropics, which we note in the following descriptions:

E. abergiana possibly can be acclimated in tropical countries.

E. capitellata succeeds in wet sand, and may be used where the climate is not too unfavorable.

E. resinifera is one of the *Eucalyptus* which best succeeds in tropical climates. It has been successful in India at Lucknow.

E. terminalis comes from tropical Queensland and may succeed in other tropical countries." This completes Charles Naudin's list.

Mr. Abbott Kinney states:

E. calophylla succeeds in the moist tropics of Zanzibar, but its leaves are very deficient in oil.

This seems rather a small list, but it by no means follows that out of one hundred and fifty species known that many have been tried. Even in our experiments with sixty or seventy species in California, we have great surprises. No doubt from the extraordinary divergence from types we find in seedlings, in an extended trial some would be better adapted to these apparently adverse conditions, and owing to the early production of

seed a new generation could be introduced in a few years that would succeed. I would recommend especially for trial *E. Corymbrosa*, found in forests associated with *E. abergiana*, and also I would especially recommend *E. alba*, a species extending to the islands north of Australia, particularly interesting, as perhaps, forming a link between the *Melaleucas* and *Eucalypts*. It is stated that Cajeput oil is sometimes distilled from its leaves.

Owing to the difficulty of sprouting all Myrtaceous seeds of trees, the least humidity in the air, or rain damping off the young seedlings, it would be more desirable to ship plants from California when well established, in pots. We have growing here nearly seventy species of *Eucalypts*; also some twenty-five to thirty other Myrtaceous plants suitable for experiment. In no other region in America have so many plants of this great Australian family of Myrtacea been introduced. This is owing to their finding here so congenial a home.

In conclusion I would ask the Academy of Sciences of Southern California to endorse the establishment of a Botanical Experiment Station near Los Angeles, or in our parks, for the following reasons:

Because vegetation recognized as antiseptic is largely Western Australian, and trees from this region have been so uniformly successful here. In no other portion of America do so favorable climatic conditions prevail.

Because *the investigation* of these various growths and their comparative antiseptic value would confer on mankind and the American people a greater benefit than any other experimental station by promoting health and prosperity in regions now almost uninhabitable for the Anglo-Saxon race.

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Authorities Consulted

- P. Mouëllefert, Professor de Sylviculture à l'Ecole Nationale
d'Agriculture de Grignon.
Flora of the Hawaiian Islands.—Hillebrand.
Mr. R. A. Rolfe, on the Flora of the Philippine Islands.
Journal of the Royal Horticultural Society.
Baron Ferd. Von Müeller, K. C. M. G. &c.
Natural History of Plants.—Baillon.
Plants of New South Wales—William Wools, P. H. D.
Professor Charles Naudin.
J. H. Maiden, Government Botanist and Director of the Botanic
Gardens, Sydney.
Abbot Kinney.
Tropical Agriculturist.