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The Address of the President - Botanical Notes on Fiji and New Zealand

Robert B. Wylie

University of Iowa
THE ADDRESS OF THE PRESIDENT

BOTANICAL NOTES ON FIJI AND NEW ZEALAND

ROBERT B. WYLIE

An expedition to Fiji and New Zealand, which occupied the summer vacation of 1922, was joined by the writer in the hope of furthering certain long desired ends. As a teacher he was anxious to experience contact with those remote regions and to observe the plants and conditions of the great middle zone. Opportunity was desired also for the collection of class room and research material not available in the temperate regions. If only one other of several objectives is named it should be the desire to see something of the economic plants and agricultural conditions in the tropics. It seems inevitable to the writer that more and more the great middle zone must be used by the white races in conjunction with native peoples. Those regions of brilliant sunshine, favorable rains, and rich soil must be drafted for intensive use within the near future. Under these circumstances it seemed a real opportunity when invited to go with a group of scientists from the University of Iowa to visit these islands of the Pacific.

Tropical conditions were first encountered by our party at Hawaii where we spent a delightful day while the “Niagara” was discharging and taking on cargo at this “half-way house” of the Pacific. We were met at the pier by a group of the science men of Honolulu, and through their courtesies and their thorough familiarity with the conditions in the region our day was made rich indeed. Our hosts not only entertained us splendidly but gave us in this short time a maximum of information, as each was an expert in his field. One feature of this rich day was a trip to the Pali where we looked down from the height of that broken mountain pass upon the rich agricultural areas spread out on the other side of the island. Beginning seemingly at our feet, but really a thousand feet below us, the fields of pineapple and rice spread out as a checkered landscape, while miles away the pound-
ing surf margined the land with white, and beyond was the distant blue of the sea. Sailing out that evening we watched Honolulu fade into the twilight—a beautiful city with the fragrance of the tropics and the bustle of our northern zone.

At Suva, Fiji, where I remained for about six weeks, we encountered a tropical vegetation with rain-forests still bordering the city and harbor on the west. There we came under the helpful influence of the British Government whose officials through their courtesies and thoughtfulness doubled the value of our stay in these islands. Similar helpful cooperation was experienced later in the summer in New Zealand.

My own experiences in Fiji included three fairly distinct phases. There was first a week spent on Makaluva Island, a small coral island a few miles from the shore of the larger island, Viti Luva, upon which Suva, the capital, is located. This island of Makaluva, which is held by the Government, was placed at the disposal of our party by the British officials. With the pounding surf but a few hundred yards away in any direction, one had opportunity for the study of coral reefs and the typical strand vegetation which covers the island itself. The fruits, seeds, and plant remains cast upon the shore by waves and tides are of constant interest to the stranger from another zone.

The second phase of my stay in Fiji included numerous short trips out from Suva into the partly cultivated areas and wild borders near the city. Relatively natural conditions may be found within easy walking distance of Government House in the Capital, but owing to the lack of improved highways it is difficult to get out very far and back the same day. A third phase included two trips into the interior of Viti Luva Island. The first of these excursions was an eight day journey into the Namosi valley as a member of a party conducted by Colonial Secretary Fell. The second, a shorter trip up the Waidena river, was taken with Mr. Harold C. Wright, acting Commissioner of Agriculture in the Fiji Islands. On both of these journeys we were quartered in the native villages and saw much of the Fijians in their own homes. The value of these trips was greatly enhanced in every way by the government officials who arranged them primarily for the members of our Iowa party.

The agricultural and commercial influences of the white man have not extended very far into the interior of Viti Luva Island. Except for the helpful work of the missionaries, which seems to have touched every Fijian, the peoples of the interior still live a
quiet and secluded life, probably much as they did before the Europeans came, without of course the warfare and cannibal feasts that characterized those earlier days. Under the protection of the British Government the natives have been secure against exploitation and still retain their lands which include the greater part of these islands. Meanwhile, primarily through the influence of the missionaries, these islands have been made as safe for life and property as any place in the world.

Speaking only of those things which impress a visitor who is interested in plants both wild and cultivated, one might comment on certain features of these islands. In the first place the luxuriance of the vegetation was rather less than had been anticipated; the trees seem to stand relatively far apart and they are not as large as I had expected to find in a region of tropical rain forests. But the somewhat scattered look of the forest, viewed from afar, is quite misleading, for near approach reveals a jungle of smaller plants, and attempts to leave the beaten path reveal barriers in the form of dense growths of all types—lianas, creeping vines, outflung roots, and tall rushes growing up from a soil that is itself often bare of ground vegetation and where one's foot falls into soft mud, the light being too dim to promote a surface growth.

Of never ending interest to the stranger are the fruit and crop plants of the area; the banana, coconut-palm, breadfruit, papaya, and mango are trees, while others such as the tara, cassava, yam, and sugar cane are herbaceous. The pine apple is but sparingly grown in the Fiji Islands though corporations are looking into
the industry. Great areas of delta land are given to the cultivation of sugar cane, largely through the help of the Indians, or Hindus from India, who are very numerous in the islands. This industry is on the decline at the present time, and while this brings at least temporary disaster to certain communities, it will prove a blessing in the long run if it leads to the development of general agriculture in greater degree than is now practiced. Both here and in Hawaii there is sharp tension between the sugar companies, who desire the intense cultivation of their crop at expense of all others, and those who favor the development of diversified agriculture.

The beautiful June morning when we ran into the harbor of Suva showed a red roofed city spread out over hillsides with the houses almost hidden by the mango trees. At that season the new shoots with young leaves were forming, and the developing foliage with its peculiar bronze color gave a coppery tint to the whole city. Bloom came a little later but we found no ripe fruit until our port call at Papeete, Tahiti, on the return trip late in August. The fruit is much prized by the native peoples of Fiji as well as by the whites, but its ripening brings nightly great swarms of bats from the interior mountains which badly ravage the crop. The mango trees were among the most beautiful in form and foliage of any seen in the tropics. A pair of these standing side by side in the Botanical Garden of Suva presented perfect dome tops with compact foliage offering a canopy-like surface to the sun.

The banana assumes treelike proportions but is really an herb, like an overgrown canna plant. It is raised extensively by whites
and natives, particularly in the alluvial soil along the stream valleys even far up into the mountainous interior. Cultivation as practiced there is simple and seemingly insufficient. The jungle is cleared away, plants are started, and some of the competing growth is slashed down from time to time. The introduced Para grass is a troublesome weed in these banana plantations. The natives of the interior build rafts of bamboo and placing on each of these a dozen bunches of bananas float blithely down the swift running rivers to the coast, delivering their fruit to the trader and letting the raft float on out to sea. They then either walk back to their inland homes, or in small groups pole flat bottomed "punts" up the rapids of these mountain streams, using consummate skill in negotiating the difficult rapids. The banana industry of Fiji has recently suffered a serious set back through the erection of an Australian tariff on this fruit thus cutting off Fiji's best market. The bananas shipped to New Zealand are cut from the stem at the port of shipment and packed solidly for the voyage in small wooden boxes. While Suva ships out thousand of bunches of bananas each month it is seldom that one can buy them in the stores. I found but a single shop where one might find them with any regularity. Their domestic use seems less common in Suva than in Iowa City.

One of the useful plants of the tropics about which Northerners know but little is the "mummy apple" or "paw paw" also known as the "papaya" its botanical name being *Carica papaya*. The tree itself resembles a castor oil plant of large growth, except that it is unbranched, and attains a height of about twenty feet. The leaves are very large, with petioles a yard long in some cases. As the apical bud lengthens the axis, new flowers and leaves are produced above, while on the pistillate plant there is a series of successively older fruits each nearly sessile upon the main axis. The lowermost ripen and are removed while above remains the series diminishing in size upward to the flower buds near the apex. The fruit looks like an elongated smooth skinned musk melon and its flesh is eaten raw, preferably with salt. The fruit does not keep long without refrigeration and is not likely to enter into the world's commerce, but in the regions of its growth it is a very useful plant.

The natives obtain the major part of their starchy food from the yam, tara, breadfruit, and cassava. The "tara," a species of *Colocasia*, is given careful cultivation and its fleshy roots are to them what the potato is to us. The beautiful breadfruit trees mark every village site and their fruit, properly cooked, is quite
palatable even on first acquaintance. Yams often attain great size, and are commonly cultivated, as is Cassava, though major dependence is placed on “tara” for the daily ration. The average Fijian can consume unbelievably great quantities of boiled “tara”.

The strand vegetation which borders the coast line is an interesting assemblage of more or less xerophytic plants. Inside the coral reef the beach is daily strewn with the seeds and fruits of many strand plants ready to take possession as soon as the waves and winds build up shores capable of offering a foot-hold. This border formation includes legumes and various soil binders, which soon form a tangle over the newer soil as built up by the waves. Some of these trailing stems get to be nearly one hundred feet long and grow with tremendous vigor.

The most characteristic plant of all such shores is the coconut palm, Cocos nucifera. Its fruits float freely and one may find the seedlings at various stages of development along the upper limits of wave action. While planted by man and encouraged by the natives it seems quite capable of taking care of itself under natural conditions. While on Makaluva Island I dug out a germinating coconut seed, the fruit having become imbedded in the sand along the shore. Hearing a protesting groan from our native helper I turned to find him shaking his head sadly and almost indignantly over my seemingly wanton destruction of a coconut seedling. He seemed relieved, however, when I carefully replaced the roots in the moist sand and buried the fruit as I had found it.

With maturer conditions of soil various trees establish themselves—such as Tournefortia argentea, Terminalia littoralis, T. catappa, Hernandia peltata, Calophyllum inophyllum, Drymippermum burnettianum, etc. One of the most striking trees of these shores is the beautiful Barringtonia speciosa, a tree attaining dignified proportions and with wonderful glossy leaves, some of which are a foot in length. Its peculiar four-faced fruits, about three inches in diameter, float freely in the sea and the natives formerly used them as floats to hold up the margins of their fish-nets.

In the muddy bays at the mouths of streams the mangrove thrives, spreading outward into deeper water as soil fills in underneath its stilted growths. The damp shaded areas beneath the mangroves are alive at low tide with creeping things. Among these are great numbers of a small fish which can scramble along on mud and may even climb among the mangrove branches above the water. The seeds of mangrove germinate on the plant and after detachment fall onto the mud or float away, some to new
places of possible growth; I found them starting to grow on the sandy shores of coral islands where conditions were impossible for their mature development.

An outstanding feature of the forests and borders was the wealth of ferns of all sorts. Representing the most varied groups of Pteridophytes they presented a great variety of form, structure, and size, ranging from the tiny filmy ferns of the rain-forest some of which were but a fraction of an inch in length, to the large tree ferns forty or more feet in height. No plants are more beautiful than the common tree ferns of Fiji, Alsophila lunulata, which flourish on the rainy sides of all these islands. They occur in very great numbers, their clean stems, rising out of the bush everywhere, each bearing at its apex a cluster of large leaves. These huge fronds, many feet in length, are soft with a silvery surface below and sway gracefully and noiselessly in the gentle breezes. They are the most beautiful plants I have ever seen.

The native Fijians commonly use the stems of these tree ferns in the construction of their attractive houses. In addition to its service for parts of the framework, a spliced pair of tree trunks, with out-turned bases, always constitutes the ridge pole of the dwelling. Amongst the matted roots of these projecting ends smaller ferns find anchorage and grow luxuriantly so that each cottage has at either gable a fine cluster of growing ferns. Engineers in charge of the construction of the new highways out from Suva were also using the stems of these tree ferns underneath the grades upon which the paving was laid. They said that if logs of tree ferns were laid under the fills it facilitated drainage. Doubtless as the softer parts of the interior of these stems decayed the outer shell of vascular and corticating tissues, which long resists decomposition, would remain as a sort of tiling extending through the soil.

I left Suva July 12 on the little steamer "Navua", which enjoyed the distinction of being the smallest transport in British service during the Great War. Four fine restful days with increasingly cooler temperature brought us to Auckland, charmingly located near the north end of North Island, New Zealand. The museum officials showed us every courtesy, greatly aiding our work besides giving us the free use of laboratories in the Museum Building.

New Zealand presented conditions very different from those encountered elsewhere. Though it has nearly the latitude corresponding to that of Iowa and we were there in the midst of their
winter season the vegetation presented essentially a summer appearance. Only a very few plants of North Island are deciduous but the evergreen leaves are mostly very thick and tough. Their winter weather except at mid-day is always chilly, often cold, and in South Island, becomes quite severe. Our party suffered greatly from the cold especially while indoors, as New Zealanders follow the English custom of leaving the house essentially at the outside temperature. Cold rooms, cold trains, cold restaurants, and cold hotels finally got on our nerves and threatened our health. Even in the interior where forests abound little wood is used for fuel.
I shivered over one week’s end in a small hotel, with thousands of cords of wood rotting in the cut-over lands within a mile of the door.

But in this type of climate, governed quite largely by its ocean environment, lies the strategy of their agriculture, at least in the North Island. The cleared land is used almost exclusively as pasture and this is grazed twelve months in the year. Little or no grain is grown on this island, and no hay need be put up to tide the stock over the winter. The only crop cultivated to supplement the grasses is turnips which are sown broadcast and left in the fields to be eaten there by the stock as needed. This general situation accounts for the pressure of the New Zealand meat and dairy products upon the markets of the world. We found land relatively high priced, comparing favorably with values here in Iowa. Agriculture there shares at this time in the same general depression that has fallen like a blight all over the world upon those who produce from the soil. Let us hope these trying days are soon to end and that the farmer, who of all workers labors hardest and longest, may early come into his rightful reward.

The New Zealand forests where not destroyed are splendid, but present new forms and strange names. Instead of oak, elm, and maple or more properly in place of pine, spruce, and hemlock, they have their Podocarpus, Dacrydium, and Agathis—Gymnosperms of the southern hemisphere not native in our northern region. The “Kauri Pine” or Agathis australis, is one of the finest trees in the world, unfortunately nearing its exhaustion as a lumber tree in New Zealand. From it is obtained the “Kauri gum” so largely exported and used as a basis for manufacture of varnish. We were impressed by the splendid growth of Pinus radiata, from America, which is planted freely all over North Island, and develops a good log there in about thirty years. They seem to grow faster than native trees though Dr. L. Cockayne assured me some New Zealand trees equalled it in rapidity of growth.

While in Wellington we were greatly aided by government officials, museum officers, and science men of the local college and Experiment Station. New Zealand people are of superior Anglo-Saxon stock, well educated, and continental rather than insular in their ideas. They are keen, wide-awake, generous, and forward-looking, with no immigration problems, and seem to be working out in splendid way the high ideals of their race.

On the return trip we left Wellington August 15 on the S.S. “Tahiti” making port calls at Raratonga and Tahiti islands. The beautiful town of Papeete on Tahiti is one of the most delightful
spots that the writer has ever visited. A French possession with a native population speaking their soft and musical language; the streets, overarched by splendid trees, called by Hall “moist tunnels of green;” banks and borders of gorgeous flowers; fragrant and strange odors; and a beautiful harbor reflecting the mountains and clouds over Moorea island; all conspired to make us love charming Papeete of Tahiti.

Department of Botany,
University of Iowa
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