The British Colony of Fiji resembles the Dominion of New Zealand in some respects, but differs from it markedly in others. Like New Zealand, it consists of two large islands and a number of small ones. As in New Zealand there is a mainland, with the rest classed as dependent or outlying islands. And therein lies one of the differences! For whereas in New Zealand a stranger would be at a loss to know which is the mainland, he would find no such confusion in Fiji. The island of Viti Levu incontrovertibly takes pride of place; Vanua Levu comes second.

This is a story of Fiji’s mainland, seen through the eyes of a New Zealand forester. It is inevitably sketchy, perhaps unbalanced, since a circuit of the island and one brief expedition into the interior were crowded into a visit of nine short days. It describes only the highlights of a most interesting and instructive journey.

Fiji stands in the path of the south-east trade winds, and has two climates. On the windward face of the islands there is a rainfall of 120 inches, well distributed throughout the year. On the leeward, north-western side the rain is confined mainly to the months from November to March, and averages only 64 inches annually. Colloquially—and in no way connected with the liquor laws—the people speak of the “wet” and the “dry” side; and on Viti Levu a very sharply defined boundary divides the two zones. At sea-level temperatures range from 60°F. to 95°F.; and although this upper limit is low for the tropics, high humidity makes conditions steamy and enervating. Up in the mountains temperatures are lower and mists are common. Though infrequent, hurricanes occasionally visit the islands, doing immense damage to crops and native houses and sometimes in the forests.

Viti Levu, just over 4,000 square miles in area, lies near the south-western rim of the Fiji archipelago. In outline it is roughly oval; the longer axis, running east and west, cut by the 18th parallel south latitude; the shorter axis by the 178th degree of longitude east. In origin it is volcanic, but the only signs of activity now evident are a few hot springs. The interior of the island is mountainous and rugged; the highest peak, Mount Victoria, rising over 4,300 feet. From the coast, alluvial flats finger inwards up the major river valleys, mangrove swamps creep outwards over the estuarine muds. Fringing coral reefs, interrupted here and there at river mouths, form a broken necklace round the island.

Lauthala Bay, the terminus for flying-boats from Auckland, is situated on the south-east coast of Viti Levu. From it an excellent road, running most of the way by the sea, leads five miles westwards to Suva, the capital city of the Colony. At one time this shore-line was protected by mangrove forest (chiefly Bruguiera gymnorrhiza, a
genus not found in N.Z.); but firewood cutters and others who regarded mangrove as unsightly removed this natural defence, with the result that wave-action has caused serious erosion. To arrest this loss of good land, stone revetments, costly to build and maintain, now border the road wherever it approaches the sea. It is noteworthy that the Fiji Department of Forestry is doing all in its power to save the mangrove forests which remain, and in some of the areas where they have been destroyed to re-establish them by artificial means.

Suva, the real starting-point of the tour, has many attractive features. Green is the key-note of the residential area, of Government House and the Secretariat. A fine avenue of shady, Ficus trees borders the water-front. A botanic garden, unimaginatively set out, but of very practical value to a stranger, lies across the road from the chief hotel. The hotel grounds even boast a Traveller’s Palm of unusual size and perfect form—Ravenala madagascariensis of the banana family, so called because the stem gushes water when cut.

From Suva going anti-clockwise, the round-the-island road cuts inland over rising and undulating ground, past the recently established Forest Training and Research Station at Tholo-i-Suva, through forest and scrub periodically cleared for food plots and now degenerate and secondary, down into the valley of the Rewa River. All this area lies in the wet zones; and the vegetation, whether natural or culti-
vated, looks rank and green. On an alluvial flat close to the river is
the Nausori airstrip, until recently used by the N.A.C. on the regular
service flights from New Zealand, via Norfolk Island and Fiji, to
Tonga, Western Samoa and the Cook group. But most of the valley
floor is planted in sugar-cane, and nearby stands one of the factories
of the Colonial Sugar Refining Company to which the cane is trans-
ported either by barge or light railway. These tramways of the
C.S.R. are the only railway systems on Viti Levu. They consist of
two-foot gauge permanently laid track following main routes, with
light-weight feeder lines which are portable and can be moved from
field to field as the cane is reaped. The fact that passengers are
carried free of charge accounts for the alarming spectacle of waving,
yelling villagers, content with a precarious finger or toe-hold swarming
over the carriages like so many busy bees.

In this valley there are also a few sawmills which draw their
supplies of logs, mainly kauvula (Endospermum macrophyllum) and
kaundamu (Myristica castanaefolia) for banana-cases, from the
neighbouring hills. Until recently the extraction of this timber was
more or less uncontrolled; but licences, with boundaries of the
milling areas clearly defined, are now issued, and measurement for
royalty payment is made at road-side or at mill skids.

North of Nausori the road leaves the Rewa, strikes out to the
coast for a short distance, and then returns to the valley of one of the
Rewa’s tributaries. Near the head of this stream the vegetation
changes abruptly. Trees give place to scrub; and at a point where
the road climbs over the watershed of this catchment, grassland
(principally Pennisetum polystachium) dominates the scene. This is
the climatic divide at the north-east end of the island, and from this
ridge the road descends across hillsides of long tawny grass to the sea
at Viti Levu Bay. Some of the smaller islands—Ovalau, Makongai
and Koro—come in sight, and on the horizon the outline of Vanua
Levu shows hazily against the sky. The existing grassland association
on the north-western face of Viti Levu is undoubtedly artificial,
largely fire-induced (Fig. 2). Given the opportunity, the country
reverts to forest, more xerophytic than the rain-forest of the wet
zone, but definitely a tree community rather than a savannah.

At Tavua a road branches inland off the main trunk and rises, at
first gently through cane fields, and then steeply up the grassed hill
slopes to Nandarivatu. This settlement, perched in a saddle 2,700
feet above sea-level, was once a district H.Q., but now survives only
as a hill resort for holiday-makers. The Department of Forestry,
recognising the possibilities of the station, is now attempting to
rehabilitate Nandarivatu. A Forest Ranger is resident there, a small
nursery has been established for exotic conifers, and work has begun
on an experimental area where improvement and release fellings are
carried out to assist the regeneration of the more valuable native
timber species. In the plots under treatment an encouraging feature
is the large number of saplings, notably of dakua salusalu (Podocarpus
and replaced by grass.

Fig. 2—Typical eroded slopes on the north-west of Yilley Lewd where forest has been destroyed.
Fig. 3—Pattern of vegetation and land-use; mangroves in the foreground; cane fields in the middle distance; grassed lower slopes and forested hill-tops in the background.
vitiensis), aumunu (Podocarpus avanicus), damanu (Calophyllum burmanii) and dakua (Agathis vitiensis, the Fiji kauri), which are thriving, a sample showing something over 400 of these trees to the acre. The plantation of Pinus caribaea along the road is, on the other hand, most unhappy; and its choice for this site seems quixotic!

From Nandarivatu a road pushes further into the mountains, terminating almost beneath Mount Victoria itself at Navai. Here Mr. Goodsir, the managing director of the Nandarivatu Timber Company, obligingly supplied details of logging and milling operations, and acted as guide in the forest. The steam-powered mill at Navai resembles the Pacific-type mill of New Zealand, but has one novel addition consisting of a single-blade, vertical, reciprocating saw, capable of tackling a log 7 feet in diameter and occasionally brought into use when a giant kauri comes into the mill. The main species sawn are dakua, dakua salusalu, aumunu, damanu and kauvula; the first three of which belong to genera represented in New Zealand's sub-tropical rain-forests. In discussing the merits and varied fortunes of Fiji kauri, Mr. Goodsir said he remembered a time in the between-war slump when he had to sell this fine timber, recognised as having properties in some respects better* than New Zealand kauri, at 56/- per hundred feet when imported insignis pine was fetching 78/-.

A newly formed bush road leads from Navai to the extraction area 5 miles away. The country is steep and dissected, and the timber trestle bridges carrying the road across some of the deep ravines are splendid examples of forest engineering. Marketable timber species are usually found in pockets; the kauri, as in New Zealand, often confined to particular ridges (Fig. 4). Considerable areas are almost barren of millable trees. Logging is by steam hauler from stump to the bush road, and thence by truck to the mill. Where the forest canopy has been broken in the course of logging operations, the growth of climbers and other scrub species is prolific. The mile-a-minute weed (Mikania micrantha) is the commonest invader, but the sensitive plant (Mimosa pudica) and the prickly Solanum torvum also colonise favourable sites. Koester's curse (Clidemia hirta), only introduced into Fiji at the end of last century, was for a time a serious menace, its spread being assisted by the Indian mynah bird. But within a few years of 1930 when Liothrips urichi was liberated as a measure of control, the host plant rapidly succumbed and is nowadays seldom encountered save in dense shade. It seems probable that tree species will ultimately, and unaided, break through and suppress these carpets and curtains of creepers; but the process may be slow and the resulting trees deformed.

Only a skeleton staff of Europeans is employed by the Nandarivatu Timber Company to direct and supervise, the Fijian and Indian subordinates being intelligent and most competent. Accommodation for these workmen is first rate, and it is characteristic of

the thought given to this matter that two styles of building are available, one favoured by the Fijian community and the other by the Indian. Kauri is the main timber used in constructing these houses, and the design is such that they can easily be dismantled into sections and moved to new sites as work progresses through the forest.

Not unimportant is the beverage, yangona (made from the root of *Macropiper methysticum* and identical with Samoan kava) universally drunk in Fiji, but specially prized after—and even during—the day’s work in the steamy heat of the jungle. Contrary to common belief, it is not intoxicating; and any slight narcotic effect it may possess can only be noticed in the case of exceptionally heavy topers. A “yangona ceremony” formed a fitting conclusion to this excursion into Viti Levu’s mountainous interior.

Back in the plains the main trunk travels through cane fields interspersed with clumps of coco-nut palms, through Mba, to Lautoka (Fig. 3). Here the Forestry Department has a district H.Q., a nursery and some plantations. In the nursery various conifers, including *Pinus patula*, *P. taeda* and the inevitable *P. caribaea* are barely holding their own in conditions both of soil and climate far different from their native habitats. In the plantations, teak (*Tectona grandis*) is making excellent progress, with the large-leaved mahogany (*Swietenia macrophylla*) doing almost as well; but the yemane (*Gmelinia arborea*) is disappointing. The vigour of a self-sown Casuarina nudiflora is a pointer to the type of vegetation best suited to this country.

An experimental “live” fire-break, consisting of a belt of closely spaced mango (*Mangifera indica*) trees, is being established on the slopes above the nursery. Due to their perennial greenness and to the absence of undergrowth beneath their dense canopy, these trees are seldom damaged by burning and tend to arrest the advance of fire. Unfortunately rats, which are one of the greatest scourges of the Pacific Islands, have nipped off the leading shoots of many of the young mango seedlings. Trials with hedge plants are also being made in this area; and it is evident that one of them, sisal (*Agave saisalana*), rapidly forms an impenetrable barrier which even cattle regard with respect. Nevertheless there is a danger that the sisal, which multiplies vegetatively at a great speed, may spread and become a nuisance.

From Lautoka, past another C.S.R. factory which fills the air with the sweet treacly smell of molasses, the road continues between cane fields to Nandi. Here at all hours of the day and night the giant trans-Pacific air-liners come in to refuel. But the town, grey with dust, holds no glamour; and the hills in the distance are brown and dry, with columns of smoke showing where grassland fires are raging.

Beyond Nandi an arid stretch of country stands testimony to man’s misuse of the land. Over-grazing and burning, evils not unknown in New Zealand, have been the cause of this degradation. In this desert the only pleasing sights are the scattered patches of *Casuarina equisetifolia* and *C. nudiflora* which here and there thinly

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clothe the eroded soil; but it is questionable whether even these aggressive colonizers can compete with that tougher colonist, the Indian peasant, with his fire-stick farming practices and herds of ravenous cattle!

Pleasanter country is encountered at Thuvu. Wind-bent palms and scarlet hybiscus border a curving bay of golden sand. Out to sea the white surf thunders endlessly on the reef. There is little wonder that honeymoon couples make for this earthly paradise from all parts of Fiji. It is here that the climatic ecotone is reached, and the vegetation on the hills begins to look green. A few miles further on, and the wet zone proper is entered near Singatoka.

Along this section of the coast a problem of drifting sand urgently needs attention. At one point a sand wave, fifty to sixty feet high, is steadily spilling across the road; and until action is taken to stabilise the dune, the task of clearing away the drift must continue endlessly. The Department of Forestry hopes to take charge of reclamation work as soon as the area can be acquired, and there are a number of native sand-binding plants which should prove useful to them in this work.

From Singatoka the road runs close to the sea, with neat Fijian villages interrupting every few miles the groves of coco-nut palms, banana plantations and, at Navua, rice fields. Thereafter, on the last lap of the journey to Suva, the road cuts inland for much of the way in order to avoid the irregularities of the coast-line. On the hilly sections the slopes adjoining the road are a patchwork of plots of dalo (*Colocasia esculenta*, of the same genus as the Maori taro), second-growth scrub and forest remnant, the result of shifting cultivation. On the flat stretches, mangrove forests often extend to the verge of the road. A working plan has been prepared for these mangroves with the object of supplying, on a sustained yield basis, the firewood needs of Suva. A rotation of 40 years has been prescribed; and thinnings are made at the 15th, 25th and 35th years, with a final felling at the end of the period. Regeneration is natural, and usually prolific; but should it fail, planting can be undertaken.

The Forest Training and Research Station lies within half an hour's motor ride of Suva. As already reported, it was seen in passing during the early stages of the round-the-island tour, but time did not permit of a close inspection until the last days of this Fiji visit. A number of small, experimental plantations of exotic and local timber trees were established at Tholo-i-Suva a few years before the outbreak of the Second World War; but it was only in 1948 that a site was cleared of jungle and the present buildings erected for the station. Much of this work was done by the staff and trainees of the department; and now there is a fine lecture room, laboratories and an office, an open-tank timber preserving plant, and village of *bures* (Fijian-style huts) for accommodating the staff and pupils.
In the forest nursery a large variety of timber trees are being planted, including many of the native and exotic species already seen during the tour, and in addition such trees as Albizzia falcata, Cedrela mexicana, Cryptomeria japonica, balsa (Ochroma lagopus) and white paper-bark (Melaleuca leucadendron). Of the ornamentals, which are raised for road-side planting and sale to the public, examples of flamboyant (Poinceania regia), pride-of-India (Lagerstroemia flos-reginae), Persian lilac (Melia azedarach), and the African tulip-tree (Spathodea campanulata) were noted. Particularly interesting was the marked effect of mycorrhiza in the beds containing pine seedlings; growth being excellent where fungi are associated with the roots, but very poor otherwise.

In the plantation area the performance of Albizzia falcata has to be seen to be believed, with a rate of growth which must leave Pinus radiata addicts in despair! Trees only 3 years old are 40 feet high with a d.b.h. of 9 inches; and there is a small group of trees put in 6 years ago—admittedly on a very favourable site—which are now over 60 feet high with diameters up to 16 inches (Fig. 5). It seems possible that this remarkable tree will provide box shooks on a 15-year rotation, and will release for better grade work the excellent native timbers, kauvula and kaundami, which are are at present used for banana cases.

In this same area the plantations of teak and large-leaved mahogany are impressive; the latter the more pleasing of the two, with clean, straight stems and healthy, vigorous crowns. An experiment in inter-planting this mahogany in old cut-over forest has also shown that it can hold its own against the rapid-growing secondary, native scrub species.

From this very sketchy survey of Viti Levu and its forestry, it may not have been evident that much of the progress made by the Department of Forestry has been the work of the last four years. The early history of forestry in Fiji makes dismal reading. As far back as 1880 a Conservator from Mauritius visited the Colony and recommended the setting up of a department, but nothing came of it. In 1926, and again 1932, two other experts reported on the needs of the country, but failed to achieve any concrete results. Only in 1938, when a forester from Malaya was seconded to Fiji, was the department finally established; and in the following year the war intervened and put a stop to normal forestry activities. It has thus been largely during the post-war period that the present organisation has been built up. From a staff of 14, with the Conservator as the only professionally trained officer, the strength of the department has now been raised to 43, and two Assistant Conservators with forestry degrees from Bangor are employed. During this period revenue has increased more than three-fold, timber and fuel extraction have been brought under control, protection has been extended to cut-over areas for natural regeneration and planting operations have been
Fig. 4—A Fiji kauri 14 feet in girth and nearly 60 feet to the first limb.

Fig. 5—*Albizia falcata*, 6 years old.
greatly expanded. Existing forest reserves are for the first time being demarcated and surveyed, and plants have been made for the reservation of much additional land. The department is indeed to be congratulated on what it has achieved in this short space of time.

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