THE BOTANY OF FUNAFUTI, ELLICE GROUP.

By J. H. Maiden, Government Botanist and Director of the Botanic Gardens, Sydney.

These observations are based on collections made by Mrs. Edgeworth David during a residence on the island in July and August, 1897, and also on some specimens collected by Messrs. G. H. Halligan and A. E. Finckh in 1898. To Mrs. David I am further indebted for many valuable notes, including the vernacular names.

Little has been published in regard to the phanerogams and vascular cryptogams of Funafuti. The principal paper dealing with the botany is that by Mr. C. Hedley.* I trust, therefore, that the observations which follow will be of some interest. Owing to the excessive humidity of the atmosphere of the small coral islands, botanical collections are usually destroyed in a short period, and it is mainly to this circumstance, I think, that full lists of the limited insular floras of the South Pacific have not been published long ago.

Some of the specimens were not sufficiently complete for absolute identification; attention has been drawn to these under the genera concerned; in a few instances not even the genus could be determined. Those cases are the plants known by the names of Pula, Molomolo, and Tala-tala-moa; there are also a few fragments of which the native names are not available.

Owing to the difficulty of preserving specimens in the ordinary way,† I recommend that the use of presses be either abandoned or used as a supplementary method, and that plants be preserved in the wet way. To this end the equipment of the botanical

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* Australian Museum, Sydney: Memoir iii. "The Atol of Funafuti." Part i.

† Mrs. David made four separate collections o pecimens, attempted to dry them in the plant press, and lost them all.

collector will be much the same as that of his zoological brother, consisting of small casks and drums, and cylindrical glass bottles (preferably preserving jars). These should be chosen with as little shoulder as possible, that is to say, they should have the widest mouths. The preserving fluid should be formol (formalin), say 2 per cent.

Jewellers' tags can be attached to each specimen, with the information written in black lead; the specimens are then placed in the liquid. A supply of muslin bags is also desirable, or muslin or butter-cloth alone for wrapping over certain specimens which are best wrapped up, either because no label can otherwise be readily attached to them or because of their liability to fall to pieces. Before putting them in the preservative, a piece of paper, written in black lead, should be placed inside the bag or cloth. A supply of string will be necessary for tying the muslin or butter-cloth packages. Of course care will be exercised that specimens which impart a deep colour to the liquid may be placed in vessels by themselves. If this little precaution be not adopted, the specimens of pale or delicate colour will be damaged. But these are common-sense matters which will appeal to every collector. Most of the specimens when taken out of the liquid will be found to be comparatively tough. The leaves, fruits, &c., of such plants as readily drop their leaves and fruits in drying will be found for the most part to remain *in situ*. The specimens should be taken out of the liquid carefully, and the liquid removed from them by pressing them gently between folds of porous paper; as soon as the readily absorbable moisture is thus got rid of, the specimens are dried in the ordinary way, *i.e.*, as if they had just been collected.

This method was adopted in the collection of the Funafuti specimens; and it has otherwise proved so successful, during the last five years, that I feel justified in believing that it will prove the key to successful collecting in these islands and other localities where the specimens are laden with salt or where the atmosphere is charged with moisture. To my knowledge, the waste of specimens received from the South Sea Islands (including New Guinea)

through circumstances beyond the collectors' control, is appalling, and has much militated against botanical research. I feel so strongly in the matter that, except under special circumstances, I would abandon presses for island collecting.

The collector will find a cheap box of paints indispensable, in order that he may indicate, in his note-book, the colour of flowers, fruits, &c. I need scarcely point out that knowledge of drawing is unnecessary in this very important matter.

Reference has been chiefly made to the following works :—

Seemann, B.—"Flora Vitiensis," 1864.
Gill, W. Wyatt—"Jottings from the Pacific," 1885.
Guppy, H. B.—"The Solomon Islands and their Natives," 1887.

It will be observed how similar are the Funafuti and Samoan names for the same plants. Several of the Funafuti names are believed to be recorded now for the first time; it is believed also that this is the case with some of the Samoan names.

Kai-kai is a term used for food both here and in the Solomon Islands, but Guppy (p. 91) states that the term has been introduced by traders.

The following note is useful to be borne in mind, as one must be cautious in making assumptions as to the use of any plant in any group of islands :—

"This leads me to remark on the singular fact that the inhabitants of one Pacific group are often unacquainted with, or make but little use of, sources of vegetable food which in other groups afford a staple diet" (Guppy, p. 90).

List of the Plants collected.

CRUCIFERÆ.

Cardamine hirsuta, Linn.—"Atasi," known as "A'atasi" in Samoa.

This may be the plant called *C. sarmentosa* by Hedley.* Both *C. hirsuta* and *C. sarmentosa* are, however, recorded from the South Sea Islands. The description of *C. sarmentosa* in both

* *Op. cit.* p. 39.

DC. Prod., and Fl. Vitiensis is very brief, but I believe the Funafuti plant is *C. hirsuta*.

PORTULACEÆ.

PORTULACA OLERACEA, Linn.—Called "Lau," which also signifies "leaf."

An allied plant, bearing the same name, occurs at Funafala, one of the northern islands of the Atoll, but I have no specimens.

It is apparently not used for food of man or beast in Funafuti. The seed was largely used for food by the aborigines of Australia, and is still used by those of the far interior, while the plant itself is eaten readily by stock.

GUTTIFERÆ.

CALOPHYLLUM INOPHYLLUM, Linn.—"Fetau," the name also used in Samoa.

This is the Tamana or Tamanu of many Polynesian islands, and is a name well known to Europeans. "Tamanu" is also applied to *Maba* sp. in Samoa.

There appears to be little to add to Seemann's full account of this tree. Locally it is used for building purposes and for making wooden dishes; there are but few trees on the main islet, but many more on the northern and western ones.

Flowers abundantly with white petals and abundant yellow stamens, with glossy thick green leaves (Mrs. David's note).

SIDA RHOMBIFOLIA, Linn., var.—"Akata"; Mr. Finckh's name is "Pula."

Recognised as a foreign plant by the natives; much fancied by them for wreaths.

This plant has the leaves of *S. cordifolia*, Linn., but the carpels have not the long awns which generally distinguish the species.

Perhaps this is the same as the awnless species from Tahiti referred to by Seemann (Fl. Vit. p. 16).

HIBISCUS ROSA-SINENSIS, Linn.—"Aute"; known by a similar name in Samoa.

"Only one plant of this noticed on main islet of Funafuti, close by a ruined hut belonging to a Samoan trader" (Mrs. David).

According to the Rev. G. H. Nobbs (who spent the greater part of his life at Tahiti and Pitcairn), the Paper-Mulberry or Tappa (*Broussonetia papyrifera*) is also known as "Aute." In that case perhaps the word signifies a fibre-plant, which both *Hibiscus* and *Broussonetia* of course are. See Lady Belcher's "Mutineers of the Bounty" (p. 387).

Mrs. David's note, made at the time of collection, is "Stamens deep yellow, flower buff-colour, crimson at bottom of cup."

Mrs. David states that there is no red Hibiscus on Funafuti, and there seems to be no doubt that the plant belongs to the widely diffused and somewhat variable *H. Rosa-sinensis*. De Candolle (Prod. i. 448) states that the flowers of this species vary from purple to white and yellow ("Variat flore purpureo albo et flavo"). I cannot detect any botanical differences in the forms. The yellow-flowering form is sparingly cultivated in Sydney.

HIBISCUS TILIACEUS, Linn.—"Fou fafine." Called "Fautu" in Samoa. The "Au" or Lemon Hibiscus of Wyatt Gill.

The bast is used for making the "takai" or men's gala dress. It is very largely used for similar purposes and for cordage in the islands. The timber is used by the Samoans for knees in boat-building.

THESPESIA POPULNEA, Corr.—"Milo." The name likewise given in Tonga and Samoa. Wyatt Gill gives the name as "Miro" in Rarotonga, but r and l are of course more or less interchangeable in the South Sea Islands.

Wyatt Gill states that the leaves are heated over a fire and used for a poultice in Rarotonga. The timber is chiefly used for boat-building in Samoa. In Funafuti the principal uses are for house-building, wooden pillows, tuais (coco-nut graters) and boxes.

Mr. Finckh's note is—"15-20 feet high, along swamp near village. Trunk about 5-6 ft.; then many shoots upwards."

TILIACEÆ.

TRIUMFETTA PROCUMBENS, Forst.—Tolo-tolo. The "Mauto futai" of Samoa.

"The plant was used for poultices for sores and boils, but appeared to have no effect" (Mrs. David).

SIMARUBEÆ.

SURIANA MARITIMA, Linn.—See B.Fl. i. 375. Found in Northern Queensland also.

LEGUMINOSÆ.

CANAVALIA ENSIFORMIS, DC., var. TURGIDA (Syn. *C. turgida*, Graham, in Bot. U.S. Exploring Exped.).—"Saketa."

This plant has to be kept in check by the natives, as it chokes small trees and other vegetation. Apparently no use is made of the bean.

CÆSALPINIA BONDUCELLA, Flem.

The seeds of this plant were picked up on the shore. It does not transpire whether this plant grows at Funafuti; this is, however, likely enough.

RHIZOPHORACEÆ.

RHIZOPHORA MUCRONATA, Lamk.—(See Beddome, Fl. Sylvatica for S. India, t. xiii., fig. 4).

"Togo." In Fiji "Dogo" is the name of the same plant (Seemann). In Samoa it would appear that the name "Togo" is applied to another Mangrove (*Bruguiera Rheedii*), while "Tupu" is the name given to *R. mucronata*. Perhaps "Togo" and its variants are generic names applied to Mangroves.

In Funafuti "Togo" wood is used for building; a dye is extracted from the bark, and the fruit is known as "pika." Height 20 to 30 feet (Mr. Finckh).

COMBRETACEÆ.

TERMINALIA sp., probably *T. Catappa*, Linn—"Talie." A similar name is used in Samoa for both *T. Catappa* and *T. littoralis*. Foliage and unripe fruit alone available.

The tree was only observed on Fuafatu, one of the northern islets, where it is a tree of 30 feet.

The leaves are obovate, and up to 6 inches long by 5 broad. The kernels are not used for food in Funafuti. These islanders

have good food supplies, which render them less dependent on the native vegetation. Talie nuts are, however, eaten in Samoa, where the people recognise the Small Talie (*Terminalia Catappa*) which grows inland, and the Large Talie (*T. littoralis*) which is found near the coast. In Funafuti one Talie appears only to be recognised; it is desirable to ascertain the species with certainty, and to ascertain if there is a second one.

In Samoa Talie timber is preferred by natives for making their "Logos" or bells, which are made by hollowing out a portion of the trunk, leaving thin sides and a few inches of wood at each end. These are then beaten with a stick, and form the summons to worship, *e.g.*, a church bell.

MYRTACEÆ.

BARRINGTONIA BUTONICA, Forst. (Syn. *B. speciosa*, Linn.).

"Futu," the name also employed in Samoa; "Utu" of Rarotonga (Gill).

The name *B. speciosa* has obtained such a hold, particularly in this part of the globe, that it seems a pity to revive the older name of *B. Butonica* now, but I follow Kew in this matter.

The flowers of this well-known plant are very fragrant. The grated seed is used as a fish-poison, but its use does not render the fish unwholesome.

The expressed juice of the scraped bark is a Samoan remedy of internal application, for what disease being a secret of the native profession.

"There is one small grove of these trees on the main Funafuti islet; it could not be ascertained that the plant was used for any purpose" (Mrs. David).

LYTHRARIACEÆ.

PEMPHIS ACIDULA, Forst.—"Gie" or "Ngie."

A gnarled shrub, the wood used for "palu" (fish) hooks, pestles (tuki-tuki), and all small articles requiring a tough, hard wood. The best firewood on the island.

ONAGRARIACEÆ.

JUSSIEUA sp.

Pickering* states that the U. S. Exploring Expedition discovered *Jussieua angustifolia* (?) in Polynesia, growing in wet grounds, but possibly introduced with taro-culture.

RUBIACEÆ.

GARDENIA TAITENSIS, DC.—"Taili."

The flowers are much prized for wreaths.

GUETTARDA SPECIOSA, Linn.—"Pua."

The petioles longer and more slender than those of the plant figured in Bot. Reg. t. 393.

It is the "Pua-pua" of Samoa. Seemann says its name in Fiji is "Buabua."

The "Pua" of Rarotonga, &c., is *Fagræa Berteriana*;† the name of this plant is "Pua-vao" in Samoa. Pua is the name of *Gardenia* sp. in Samoa according to Pratt (Samoan Dict.).

The leaves of *Guettarda speciosa* in Funafuti are a foot long, and often the same in greatest breadth. They are used for covering in native ovens. The flowers are much used for wreaths. The wood is rather soft, but is used in buildings, and some inferior dishes and bowls are made of it.

MORINDA CITRIFOLIA, Linn.—"Nonu," both here and in Samoa; "Noni" and "Nono" are other spellings of the same name in use in other islands.

The root is used for making a reddish-yellow dye. The madder of commerce is, of course, the product of an allied plant (*Rubia tinctorum*, Linn.).

The fruit is, say, a couple of inches long, and of a yellowish-green when dead ripe. It is not eaten by Funafuti natives, but they have the idea that some white men eat it; it is, however, most nauseous to an ordinary palate. The Rev. Thos. Powell‡ states that in Samoa it is cooked as a delicacy for the sick.

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* 'The Races of Man.' Ed. J. C. Hall, 1854, p. 324.

† Wyatt Gill, 'Jottings from the Pacific,' p. 189.

‡ Journ. Bot. vi. 360.

In Samoa this is looked upon as a plant possessing medicinal virtue. Its leaves, when bruised or cut up small, are used for dressing ulcers, sores and open wounds. They are used for poultices in Funafuti.

COMPOSITÆ.

ADENOSTEMMA VISCOSUM, Forst.—Called "Kisi-kisi," by some of the islanders. "Pepe-pepe" is its designation in Samoa. Mr. Finckh gives its name as "Lauti," and says that the root is eaten when cooked.

WEDELIA BIFLORA, DC.—"Lakou-monog."

The common scrambling seaside shrub. It is known as "Ate-ate" in Samoa, where the leaves are used medicinally as a general tonic; they are put to a similar use in Lord Howe Island.

Wedelia strigulosa, DC. (Hedley, p. 39), is not known on the island, and is either intended for *W. strigulosa*, Benth. et Hook. f., or is perhaps *W. biflora*, DC. Both *W. biflora*, DC., and *W. strigulosa*, Benth. et Hook. f., occur in Tonga and other South Sea islands.

GOODENIACEÆ.

SCÆVOLA KŒNIGII, Vahl.—"Ngassu" (Mr. Finckh).

A sea-shore plant found also in Australia.

APOCYNACEÆ.

OCHROSIA BORBONICA, Gmelin.—Fao; the "fau" of Hedley.

Mrs. David brought specimens of an *Ochrosia* which she states is the only fao on the island, and which was the one supplied to Mr. Hedley by the natives. It has been referred by that gentleman to *O. parviflora*, Hensl.* This is an inadvertence, as the fruits of *O. parviflora*, Hensl. (a synonym of *O. elliptica*, Labill.), are red, are not fibrous (not to mention other differences) like the specimens collected both by Mr. Hedley and Mrs. David.

O. elliptica, Labill. (*O. parviflora*, Hensl.) occurs both in Eastern Australia and the Pacific Islands. I have consulted Henslow's description† based on a plant collected by Darwin in

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* Hedley, *op. cit.* p. 32.

† Ann. Nat. Hist. i., 345, 1838.

the Keeling or Cocos Islands, and that by G. Don,* based on a plant collected by Forster in the Sandwich Islands, and I follow Bentham† in considering them a synonym of *O. elliptica*, Labill.

The Funafuti species (and it appears to be the only one) is the widely diffused *O. borbonica*, Gmelin.

BORAGINEÆ.

Cordia subcordata, Lamk.—Kanava.

See 'Fl. Vitiensis,' p. 168, also tab. xxxiv.; the plate appears to be a little highly coloured as regards the flowers of a Funafuti tree. It is the handsomest tree on the island; it is commonest at Fuafatu.

Bowls and dishes are made of this wood, for which purpose it is much esteemed; also for the wooden boxes called "Turuma," used for the natives to place in their canoes to store small articles, *e.g.*, matches, tobacco, fish-hooks, which are required to be kept dry. The fresh wood smells like violets, resembling in this respect the Myall-wood (*Acacia pendula*) of Australia.

It is the "Tauanave" of Samoa, and the fruit is eaten in hard times by the natives of that group.

It is the "Nawanawa" of Fiji, according to Seemann, who states that the seeds are eaten in that group also.

Tournefortia argentea, Linn.—"Tausunu."

CONVOLVULACEÆ.

Ipomæa biloba, Forst. (Syn *I. Pes-caprœ*, Roth.)—"Fue."

Seemann says the leaves are roasted and used for caulking canoes in Fiji.

ACANTHACEÆ.

Ruellia reptans, Forst.—DC., Prod. xi. 145.

Observed only on the northernmost islets. Opataia, an intelligent native, gave the name as "Kisi Kisi." See *Adenostemma*.

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* General History of the Dichlamydeous Plants, iv. 99.

† B.Fl. iv. 310.

VERBENACEÆ.

PREMNA TAITENSIS, Schauer.—"Valo valo." ("Vallo vallo," Finckh). The "Aloalo" of Samoa, and the "Awahlo" of Tahiti (Solander, quoted by Seemann).

It yields the favourite wood for getting fire by friction in Funafuti. In Samoa the leaves are crushed and mixed with coco-nut oil, which is rubbed on limbs affected with the preliminary symptoms of elephantiasis. Possibly it retards, but it certainly does not cure, this disease.

Mrs. David states that valo-valo leaves are used in Funafuti to scent coco-nut oil for anointing purposes. It is a gnarled tree of about 25 feet.

RIVINA LÆVIS, Linn.

A native of South America and the West Indies; largely cultivated as an ornamental plant. The whole genus, consisting of about 10 species, is from tropical and subtropical America, but has been introduced into tropical Asia and the African Islands, according to Bentham and Hooker's 'Genera Plantarum.' It may have spread from tropical Asia to the South Sea Islands. Recorded from Tonga by Hemsley.* Mrs. David says: "Fruit brilliant scarlet and falls off readily when ripe. Abundant; a common weed."

AMARANTACEÆ.

ACHRYANTHES ASPERA, Linn.—"Polo."

Found at Fuafatu.

NYCTAGINEÆ.

BOERHAAVIA DIFFUSA, Linn.—"Kalisi-lisi." Called "Kisi" by some.

It is apparently pût to no use in the island. In Australia it is a useful fodder plant for sheep. Mr. Finckh's note, "Creeper; they say imported."

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* Journ. Linn. Soc. Bot. xxx., 189.

LAURACEÆ.

HERNANDIA PELTATA, Meissn.—"Puka," ("Buka," Mr. Finckh). The "Buka" of some other Polynesian islands. The "Pu'-a" of Samoa. Not to be confused with *Gardenia*. The inflated involucel is of a pale green colour. In old times the fruits were made into charcoal, which was used as a pigment for tattooing. The wood is used for making canoes.

CASSYTHA FILIFORMIS, Linn.—"Tetai."

This leafless parasite is used for streamers for purposes of personal decoration.

EUPHORBIACEÆ.

MACARANGA sp.—"Ogogo." (See *Fleurya*).

Apparently very near *M. involucrata*, Baill., but the specimens too imperfect for absolute determination. For a list of South Sea Island Macarangas see 'Fl. Vitiensis,' p. 228.

URTICEÆ.

FICUS sp.—"Felo." "Tefelo," about 20 feet high (C. E. Finckh). "Shiny leaves and yellow fruits."

The specimens at my disposal do not permit me to determine this fig with absolute certainty. It is apparently not more nearly allied to any Indian species than to the Australian *F. eugenioides*, F.v.M. The receptacle is too much advanced in fruit to admit of examination of the male and female perianths.

Mrs. David says that the fruits, which are about the size of a marble, are occasionally used for food in Funafuti, but there are very few trees. The children string the figs together for necklaces.

ARTOCARPUS INCISA, Forst.—"Mei fenua muli." Perhaps the name of one of the numerous cultivated varieties of the Breadfruit. Breadfruit in general is known in Samoa as "Ulu" and in Fiji as "Uto."

FLEURYA RUDERALIS, Gaud. (?)—DC., Prod. xvi. Part i. p. 74. An imperfect specimen. "Luna."

The natives are not afraid of the sting of this nettle (*Cf.* Seemann).

Two species of *Fleurya* are known in Samoa as "Ogogo." See *Macaranga*. *M. involucrata* and *Fleurya* resemble each other superficially.

PIPTURUS VELUTINUS, Wedd.—"Fou tagata." Perhaps the *Broussonetia papyrifera* of Hedley (*op. cit.* p. 34). Used as a fibre plant. Makes the strongest fishing lines, to which manufacture it is chiefly put.

AMARYLLIDEÆ.

CRINUM ASIATICUM, Linn.—"Tapua."

This plant is said by Samoans to indicate the land most suitable for cultivating Breadfruit.

"The trader said he introduced this plant from Samoa. Its flowers are very much valued by the youths and maidens, who bind the long narrow white perianth segments into wreaths" (Mrs. David).

TACCACEÆ.

TACCA PINNATIFIDA, Forst.—The flower is known as "Niupiu," and the whole plant, including the tuber, as "Vatia" ("Vadia," Finckh).

The flowering stalk is $6\frac{1}{2}$ ft. long ("3 ft. high, flower on stem 4-5 ft." Finckh). The tuber makes excellent arrowroot, which is well known but seldom made in Funafuti.

It is the "Māsoā" of Samoa. In that group this arrowroot is used by the natives chiefly in the preparation for sick people of "Vai solo," which is a mixture of the young coco-nut oil and grated arrowroot.

LILIACEÆ.

CORDYLINE TERMINALIS, Kunth.—"Ti."

Very plentiful. The leaves used to be employed for covering up the native ovens. The roots were formerly much used for food on Funafuti.* For an account of the uses of this plant, see Seemann (Fl. Vit. p. 311).

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* But since the introduction of taro and bananas the natives have almost abandoned the cultivation of this plant because of the hard work it entails. (Mrs. David).

PANDANACEÆ.

PANDANUS (1).—"Fala vao." "Laufala" of Samoa.

Probably Wyatt Gill's "Thatch-tree." This is the wild plant. The leaves are used for making house mats and for thatching, and the orange-coloured drupes are chewed and much esteemed.

Pandanus timber, though spongy and very inferior, is used for posts and rafters and building purposes generally; it is said to have a life of five to seven years under cover.

PANDANUS (2).—"Fala kai." Probably Wyatt Gill's "Mat-tree." The cultivated plant. The head of fruits ("cone") is larger than that of the preceding, and the fruits more succulent. The kernels ("almonds") of *Pandanus* are not eaten on Funafuti, as better food is more readily available.

The specimens brought to Sydney are insufficient to identify the species with certainty, but according to Wyatt Gill (*op. cit.* p. 183, &c) "fala vao" is probably *P. odoratissimus*, while "Fala kai" is *P. utilis*. To this work we would recommend reference for further particulars in regard to these Pandani. To Guppy's work we would also recommend reference; it contains much information on the subject.

PALMACEÆ.

COCOS NUCIFERA, Linn.

The well known Coco-nut is very plentiful, but I received no specimens.

AROIDEÆ.

COLOCASIA ANTIQUORUM, Schott.—(See Bot. Mag. t. 7364).

There are perhaps six cultivated varieties on Funafuti, of which the names of three are Taro, Ikaluoi and Pulaka.

A spathe brought to Sydney by Mrs. David belongs to the variety called "Pulaka"; the lower part is striped longitudinally with purple.

In Samoa this well-known food-plant is called "Taro" or "Talo." There are many varieties of land and water Taro and wild Taro. Among wild ones are Pula'a, Pula'ū, Pula-fui, Pula, &c.

For further notes on this plant, see Seemann ('Fl. Vit.' p. 285).

For an analysis of the tuber of this plant see *Arum esculentum*, Herapath, Liebig u. Kopp, Jahresb. 1850, Tab. D. (quoted in Wolff's 'Aschen-Analysen,' i. 99).

CYPERACEÆ.

Scirpus sp.—Section *Isolepis*, apparently allied to *S. riparius*, Spreng., but too imperfect for absolute determination.

GRAMINACEÆ.

Eleusine indica, Gaertn.

Common in coastal Queensland and north-coastal New South Wales. Has spread down the coast as far south as Sydney.

Eragrostis ciliaris, Link.

Growing in great profusion near the ruins of the house of Williams, a trader.

The distribution of this grass is given as "Tropical regions and South Africa," but the species does not appear to have been recorded from the South Sea Islands before. Our plant is identical with a specimen from an island off the coast of Florida, U.S.A.

Lepturus acutiglumis, Steud.

Described originally from specimens collected by D'Urville in Tahiti. Collected also by Rev. S. Whitmee in the Gilbert Islands, according to a specimen kindly communicated by Mr. J. G. Luehmann.

Lepturus repens, R.Br.

North Island. Found also in Queensland, in addition to other Pacific Islands.

FILICES.

Pteris marginata; Barz.—"Lakau-sauga."

Asplenium Nidus, Linn.—"Bird's Nest Fern." "Kau."

Found on the North Island, the fronds being from 2 to 8 feet in length. The curled young tip of the frond is cooked in cocoa-nut milk and eaten. It is the "Laumapapa" of Samoa. Our

omnivorous Australian blacks do not appear to have used this fern for food.

NEPHROLEPIS EXALTATA, Schott.—"Sulufe."

Found on trees; the fronds are up to 8 feet in length.

POLYPODIUM NIGRESCENS, Blume. — "Maile," "Maili," or "Meili."

Used for scenting purposes. The young fronds are rubbed on the hands and bodies of the natives, who also use them for scenting coco-nut oil.

LYCOPODIACEÆ.

PSILOTUM TRIQUETRUM, Swartz.—"Fulukimoa."

LICHENES.

PANNARIA MARIANA, Fée.

A handsome foliaceous lichen on bark of a living tree (Coll. C. E. Finckh).

Previously recorded in this part of the world from the Richmond River, N.S.W., Queensland and New Zealand. (Determined by Mr. E. Cheel).

Contemplation of the above incomplete list of 38 species of Dicotyledons, 12 Monoctyledons, 5 Vascular Cryptogams, and 1 Lichen shows that the plants are all more or less widely distributed in the Pacific Islands as denizens of other coral islands or of the coastal tracts of the larger islands. At the same time it is very useful to have a census of the plants found on each island or group of islands in the Pacific; and when this work shall have been undertaken to a very much larger extent than has been done up to the present, we shall be able to draw interesting conclusions as to the migration and geographical distribution of plants which will be very much less based upon guesswork than at present.

The following expresses my views as to the probable or possible ways in which the present vegetation of the island obtained a footing upon it. It is proper to state that in many cases we

have no direct evidence as to the methods by which plants are transmitted over stretches of ocean; this applies to many other islands and territories besides Funafuti.

1. Floating seeds distributed by ocean currents.

Calophyllum inophyllum, Linn.
Hibiscus tiliaceus, Linn.
Thespesia populnea, Corr.
Suriana maritima, Linn.
Canavalia ensiformis, DC. var. *turgida*.
Cæsalpinia Bonducella, Fleming.
Rhizophora mucronata, Lam.
Terminalia sp., prob. *T. Catappa*, Linn.
Barringtonia Butonica, Forst.
Pemphis acidula, Forst.
Gardenia taitensis, DC.
Guettarda speciosa, Linn.
Wedelia biflora, DC.
Scævola Kœnigii, Vahl.
Ochrosia borbonica, Gmelin.
Cordia subcordata, Lam.
Tournefortia argentea, Linn.
Ipomœa biloba, Forsk.
Hernandia peltata, Meissn.
Pandanus sp.
Cocos nucifera, Linn.

2. The seeds adhering to the roots of introduced plants or to the feet of birds.

Jussieua sp.
Scirpus sp.
Eleusine indica, Gaertn.
Eragrostis ciliaris, Link.
Lepturus acutiglumis, Steud.
Lepturus repens, R.Br.

3. The following have succulent fruits which are eaten by birds.

Morinda citrifolia, Linn.
Cassytha filiformis, Linn.
Rivina lævis, Linn.
Premna taitensis, Schauer.
Ficus sp.
Pipturus velutinus, Wedd.

4. A viscid plant which adheres to birds and animals.

Adenostemma viscosum, Forst.

5. The fruits of the following are burrs.

Achryanthes aspera, Linn.
Boerhaavia diffusa, Linn.
Triumfetta procumbens, Forst.

6. The spores of the following ferns may travel for a considerable distance through the agency of wind; also they would

remain alive for a considerable period on the bark of trees conveyed by ocean currents.

Pteris marginata, Borz.
Asplenium Nidus, Linn.
Nephrolepis exaltata, Schott.
Polypodium nigrescens, Blume.
Psilotum triquetrum, Swartz.

7. The following were purposely introduced by man.

Hibiscus Rosa-sinensis, Linn.
Artocarpus incisa, Forst.
Crinum asiaticum, Linn.
Colocasia antiquorum, Schott.
Pandanus sp.

7A. The two following food-plants may have been introduced, by man's agency, to this island.

Tacca pinnatifida, Forst.
Cordyline terminalis, Kunth.

8. The following are widely diffused weeds, and may have been brought by man.

Cardamine hirsuta, Linn.
Portulaca oleracea, Linn.
Sida rhombifolia, Linn.

9. I do not express an opinion as to the way in which the following plants obtained a footing; perhaps there may be a few other plants, but I have not a complete list before me.

Ruellia reptans, Forst.
Fleurya ruderalis, Gaud. (?)
Macaranga sp.