38

RECORD

100/100

Collection and Field Note Book

No. 38

(December 29, 1953 - February 3, 1954)

(35324 - 35676)

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1953 - Guam

1

Dec. 29 - Lost River Grazing
Station, U.S.G.

Karst topography
with flat-bottomed
valleys - river flood plains.

On these flood plains
are open grassy ~~spots~~
areas, dominated by
Paspalum conjugatum.
Whether these are natural
or not is hard to tell,
but seems unlikely.
There ~~are~~ are *Musa*,
Cordyline (red leafed form),
and what seems to be
the cultivated *Antiarpus*
common enough here,
as well as *Alocasia*,
Muntingia, *Leucaena*,
Cestrum, and other
indicators of disturbance.

The forest on the limestone
contains

- c *Cananga odorata*
- c *Pandanus tomentosus*
- + *Pandanus dubius*
- c *Cycas circinalis*
- o *Araucaria*
- c *Dysoxylum nuanetsii*
- o *Ocotelea oppositifolia*
- c *Hibiscus tiliaceus*
- o *Antiarpus altissimus* (cult. form)
- c *Musa sapientum*

- c *Cestrum diurnum*
- c *Triphasia trifolia*
- c *Alocasia macrorrhiza*
- o *Morinda citrifolia*
- o *Intrisia bijuga*
- o *Muntingia calabura*
- c *Piper guahumense*
- o *Freycinetia torresiana*
- o *Caesalpinia*
- c *Tectaria crenulata*
- c *Polypodium punctatum*

Dec. 30 - Tutujan, Agaña
Cultivated plants
around house of Dr. Liming
U.S.D.A. entomologist:

- Hibiscus mutabilis*
- Sansevieria roxburghiana*
- Nephrolepis hirsutula*
- Gomphrena globosa*
- Canna* (hybrids)
- Hibiscus* (hybrids)
- Caladium bicolor*
- Cordyline terminalis*
- Psidium guajava*
- Gossypium barbadense*
- Cucurbita pepo*
- Barleria cristata* (Thompson form)
- Tabernaemontana coronaria*
- Cocos nucifera*
- Solanum lycopersicum*
- Plumeria rubra*
- Lactuca sativa*
- Phaseolus lunatus*
- Cucumis sativa*

- Citrullus vulgaris*
- Carica papaya*
- Pedilanthus tithymaloides*
- Raphanus sativus*
- Allium cepa*
- Psophocarpus tetragonolobus*
- Solanandra guttata*
- Solanum melongena*
- Capricum frutescens*
- Hibiscus sabdariffa*
- Frankia?*
- Hedychium coronarium*
- Alocasia macrorrhiza*
- Musa nana*
- Zephyranthes rosea*
- Heterospatha elata*
- Manihot esculenta*
- Musa sapientum*
- Bauhinia* sp.
- Bougainvillea spectabilis*
(red fl., glab. with lvs.)
- Scindapsus aureus*
- Polypodium scolopendria*
- Polypodium punctatum*
- Asplenium nidus*
- Clerodendrum speciosissimum*
- Eri*

1953 Guam

Dec. 30 - lower Fonte River
Deep shaded ravine,
alluvial soil.

35324

Angiopteris evecta

single plant seen, almost
washed loose from side
of lowest trench of ravine

5

25

Bambusa vulgaris Schrad. Schrad. ex Willd.

~~dense clumps, culms~~
Common on sides and
terraces of ravine

Dec. 30 About 3 km s. of
Agat, ~~just at~~ (old bridge)

5

26

Panicum

common in flat just
back of beach near stream

Dec. 30 - ridge s. of Mt.
Lamlam

degraded forest on
limestone

7

27

Mucuna

common in bushy places

6

28

occasional in bushy
vegetation

5m

stem barrel-shaped,
pinnules stipulate, 2.5 m.
long.

det. McClure

dense clumps, culms
originating close together,
erect, somewhat arching
outward, dark green,
up to about 8 cm. thick,
internodes up to 3 dm.
long, culms to 10-15 m. tall.

2m

decumbent

385 m.

extensive tangled vine;
flowers pendent, pale
green, hairs on calyxes
irritating.

shrub 2 m. tall; ~~fruit~~
leaves very rugose;
flowers green, fruiting
involucres yellowish,
slightly fleshy.

35329
15

Pisonia cauliflora
rare in broken-down
forest

30 *Tarenna*
rare in forest

31 *Maesa*
rare in forest

32 *Ficus prolixa*
common in forest

33 *Ficus prolixa*
common in forest

34 *Humata heterophylla*
epiphytic on *Ficus* branches

35 *Vittaria*
epiphytic on *Ficus* branches

36 *Peperomia*
epiphytic on *Ficus* branches, rare

old tree almost
smothered by strangling
fig. inflorescences
at lower nodes on
branches as well as
terminally, flowers
pinkish; fruit not
quite mature. (note
rolled up leaves in seed).

tree 15 cm. diam., 8 m. tall,
fruit immature;
leaves tending to be
somewhat rolled.
shrub 1.5 m. tall;

flowers pinkish white.
banyan type tree,
long spreading horizontal
branches supported by
aerial roots; figs
dark purple when ripe.
(possibly same tree as #35333)
banyan type tree; figs
dark purple when ripe;
stipules elongate, several cm.
only on very fast growing
branchlets (*F. tenuistipula* Merr.)
fronds glossy.

pendent

glossy

Dec. 30 - Base of Orote Peninsula
abandoned cultivated
ground, broken thickets and
marshes.

35337

Trinera

5

edge of Eleocharis marsh,
locally abundant

6

38

Polygonum

locally abundant
in marshy spot.

7

39

Pyrosia lanceolata

epiphytic on coconut trees

8

+ m.

culms erect

stems decumbent,
ascending distally;
flowers white
fronds fleshy.

300

Jan. 1 - Tutejan, ^{Agaña}

Cultivated

35340

Luffa

climbing on fence

- 41 Hibiscus sabdariffa
in garden

Jan. 2 - north of Wettegel
junction

cleared ground on limestone

- 42 Crotalaria mucronata ^{Desv.}
small colony near road

- 43 Pennisetum
abundant.

Jan. 2 - 2 km inland from
Hilaan Point

- 44 Digitaria insularis
rare in open field

Jan. 2. - Tamuning
cultivated in garden

- 45 Gaillardia ~~frida~~ pulchella Foug.
46 Aster nov.-belgii L.

- 47 Malpighia coccigera

- 48 Duranta repens

50 m
150

extensive vine; flowers
bright lemon yellow; fruit
elongate, angled.
herb 1.5 m. tall, much
branched, almost leafless
at this season, hairs
in inflorescence irritating,
calyx in fruit purplish
red, fleshy.

100 m

erect herb 1 m. tall,
branched; flowers
yellow with brown line.
forming tangles
2-2.5 m tall.

100 m

small tuft
~~caespitose~~, culm erect.

15 m.

- rays red with yellow tips
- rays ~~red~~ lavender,
- disk yellow, turning reddish.
- shrub 1 m. tall, leaves
- glossy.
- shrub 1.5 m. tall,
- fruit immature.

- 35349 *Chrysanthemum morifolium* ?
 1
 1 50 *Chrysanthemum morifolium*
 1 51 *Pseuderanthemum bicolor* (S. L.) Radlk.

- 1 52 *Asparagus plumosus*
 1 53 *Coreopsis tinctoria* Nutt. ?
 2 54 *Plumbago auriculata*
 1 55 *Angelonia*
 1 56 *Rosa*

Jan. 2 Trail to Tweed's
 Cave, Hagatña.

~~Terrace~~

terrace at base of
 cliffs in reentrant,
 tall moist forest.

- 1 57 *Discochalcis*
 rare

4 58

dominant tree in forest,
 seedlings abundant in
 shade.

- low herb, flowers
 light yellow.
 low herb, rays pinkish.
 shrub 1 m. tall; leaves
 deep bronze purple; flowers
 white with red
 dots on lobe, especially
 near throat.
 low herb.
 low herb, rays deep
 brownish red, with
 yellow tips.
 low herb, flowers
 pale dull blue.
 low herb, flowers deep
 violet.
 low shrub, flowers
 deep crimson.

22 m.

shrub 1 m. tall,
 fruit immatures
 trees 40 m. tall, stones
 and seedlings picked
 up on ground beneath trees.

Jan. 2 - Tweed's Cave

Reports

limestone cliffs

35359

Ficus prolixa

4

common on bare limestone

4

60

Ficus prolixa

bare limestone

2

61

Ficus prolixa

bare limestone

The actual cliffs here are covered by *Ficus prolixa* in several forms, with *Pandanus dubius* quite abundant, *Claoxylon*, *Pipturus argenteus*, *Papatea*, etc., with abundant *Tectaria crenata* and *Procris pedunculata* (which does form sort of a vine-like habit at times, and has rose colored fruits).

Below the cliffs on the shelf between 10 and 20 m. is a rather open coconut grove on a small part with some soil. On the greater part which is very rocky (small karrenfeld) is a

Triplaris
common.

Tectaria
abundant.

Procris
climbing
in trees
flagellans
also.

90 m.

shrub, or small tree, aerial roots spreading over rock surface.

shrub, old leaves gone, new ones just emerging; roots spreading over rocks. new leaves just expanded, aerial roots spreading over rocks.

magnificent tall forest, not measured but estimated at 30-45 m. dominated by #35758, with and *Ficus prolixa*, the latter less abundant but taller. Strangler habit very conspicuous. Second story in the forest about 4 m. tall, of saplings of #35758, and a lower story 0.5 to 1 m. tall of seedlings of the same species. Seems to be completely tolerant of shade - seedlings and saplings very healthy. Several large clumps of *Bambusa*.

The forest on the slope up to the plateau is largely *Antocarpus*, *Triplaris*, *Aglaia*, *Guamnia*, *Cycas*, *Morinda*, *Cremna*, etc.

Forest on top, where still existing, is largely *Antocarpus* and *Sandersonia*.

Jan. 3 - Tanning

35362

cultivated in pot in shade

Jan. 3 - top of Mt. Lamlam

decadent moist forest on limestone

locally common

common

65 *Morinda umbellata* v. *glandulosa* (rare) local occasional

Jan. 5 - top of flat topped erosion remnant

5 km. east of ~~the~~ bay

66

(5) *Andropogon fragilis* B. & P.

common in grassy vegetation on heavy red soil

15 m.

prostrate, leaves flat on ground, dark purplish green with light green along veins, very rugose, corolla bright crimson.

400 m.

sterile tree 10 m tall, 3 dm. thick (same as #35362) shrub 2 m. tall, leaves white beneath, ^{green} rugose above, vines climbing in top.

160

abundant

Jan. 3 - Mt. Lamlam -
summit plateau.
Dissected limestone beds.

This plateau is karst-like in topography, with sharp peaks here and there, the limestone very rough.

The vegetation is a degraded forest, much resembling that on the northern plateau but practically lacking *Artocarpus* and with a little *Areca*. That it is secondary in nature is well shown by the abundance of *Hibiscus tiliaceus*, which forms a "background" throughout the part of the area examined.

Practically all large trees show the effects of typhoons in dead tops and upper branches and a general ragged appearance.

The whole aspect of the forest is low and tangled. Its height varies from 2-3 m. on the high points to perhaps 15 m. in sheltered depressions.

Larger trees stand out here and there, up to 15 or more m.

Composition is, roughly,

- a *Hibiscus tiliaceus*
- a *Ficus prolixa*
- a *Ipomoea indica*
- a *Mucuna pruriens*
- c *Macaranga thompsonii*
- c *Aglaia mariannensis*
- c *Pandanus dubius*
- c *Pandanus tectorius*
- c *Areca cathecu*
- la *Cycas circinalis*
- la *Freyinetia torresiana*
- la *Alocasia macrorrhiza*
- c *Piper guahumense*
- c *Nephrolepis hirsutula*
- c *Davallia solida*
- c *Polypodium punctatum*
- o *Fagraea berteriana*
- o *Ficus vinctoria*
- o *Guamia mariannensis*
- o *Pipturus argenteus*
- c *Premna obtusifolia*
- o *Triphasia trifolia*
- o *Elaeocarpus foga*
- o *Guettarda speciosa*
- o *Procris pedunculata*
- o *Medinilla rosea*
- o *Psidium guajava*
- ^ *Artocarpus attilis*
- ^ *Pouteria*
- ^ *Leucaena glauca*
- o *Morinda citrifolia*

Maesa

In open places, clearings,
roadsides, etc.

- a *Paspalum conjugatum*
- c *Chloris inflata*
- c *Cenchrus echinatus*
- c ~~*Phyllanthus*~~
- c *Conyza bonariensis*
- cc *Dryopteris unita* (?)
- c *Pilea microphylla*
- dc *Phyllanthus marianus*
- cc *Miscanthus floridulus* (limestone ledges)
one clump in open on
flat and common on
bare limestone ledges.
- l *Cestrum diurnum*
- n *Hyptis capitata*
- n *Cynodon dactylon*
- n *Eleusine indica*

In cleared places
Piper guatemense persists
even in open, but the
leaves tend to become
bullate - rugose when
growing in sun.

To the east of the
main ridge on this
plateau and at a some-
what lower elevation
there is what appears
to be an area of marsh,
some acres.

Jan. 7 Jumbulong Manglo

Volcanic peak,
very sharply set off
from limestone to north.
Mosaic of *Miscanthus*
and *Dimeria* communities.
Some indication here
of actual invasion of
Dimeria communities by
Miscanthus - in form
of numerous small
tufts of *Miscanthus*
in what otherwise
appear to be a pure
Dimeria stand.

Composition of *Dimeria*
community:

- a *Dimeria chloridiformis*
- la *Miscanthus floridulus*
- c *Elephantopus mollis*
- c *Hedyotis megacarpa*
- c *Lycopodium complanatum*
- c *Phyllanthus seffordii*
- c *Hyptis capitata*
- n *Myrtella bennigseniana*
- n *Wikstroemia elliptica*
- n *Decaspermum frutescens*

Bare erosion scar:

- c *Blechnum orientale*
- c *Stenoloma*
- c *Phyllanthus seffordii*
- c *Chrysopogon aciculatus*

In the *Miscanthus* community the dominance of *Miscanthus* is such that only in small openings are other plants commonly seen. The *Miscanthus* reaches 2 m. in height and is difficult to walk through.

- a *Miscanthus floridulus*
- c *Chrysopogon aciculatus*
- o *Wikstroemia elliptica*
- o *Elephantopus mollis*
- o *Ageratum conyzoides*
- o *Dimeria chloridiformis*
- o *Phyllanthus saffordii*
- o *Blechnum orientale*
- o *Melastoma malabathricum*
- or *Athyrium* sp.
- r *Lygodium scandens*

To the south of this is a ridge, examined only at a distance, which, on its southwest slope, is very steep, and deeply dissected by headward erosion. The other side is a gently sloping rather smooth surface. Into this are cut a few shallow dendritic ravines.

~~At the~~ Here the general pattern seems to be *Miscanthus* on steeper slopes and in wetter places, *Dimeria* on gentle slopes with some *Miscanthus* locally, ravine forest in all ravines.

Jan. 5 - 2.3 km. e. of Apra Heights.

Old lava flow, much weathered. Vegetation very broken down.

Plants growing on this material:

- a *Gleichenia linearis*
- a *Dimeria chloridiformis*
- la *Miscanthus floridulus*
- la *Scleria (large)*
- la *Lindaea ensiformis*
- c, la *Myrtella bennigseniana*
- c *Wikstroemia elliptica*
- c *Geniostoma*
- c *Rhynchospora ^{suba} ~~compensans~~*
- c *Rhynchospora*
(small, open infl.)
- c *Hyptis capitata*
- c, la *Melastoma malabathricum*
- c *Chrysopogon aciculatus*
- c *Elephantopus mollis*
- c *Casuarina equisetifolia*
- lc *Dianella*
- o *Phyllanthus saffordii*
- o *Scaevola frutescens*
- o *Merinda citrifolia*
- o *Waltheria indica*
- o *Blechnum orientale*
- o *Pouteria*
- o *Cassytha filiformis*
- o *Cheilanthes tenuifolia*

This is surrounded by flat and rolling ground, with almost

solid *Dimeria*, here and there a patch of *Miscanthus*, and in low wet spots, solid stands of *Phragmites*.
Ravine forest in ravines.

Jan. 5 3 km. e. of Apra Hts.
Small remnant, but

no red soil - surface soil blackish, merely a knob remaining.

Composition of vegetation:

- a *Miscanthus floridulus*
- la *Mitracarpum hirtum*
- la *Elephantopus mollis*
- c *Dimeria chloridiformis*
- c *Hyptis capitata*
- c *Centella asiatica*
- c *Ageratum conyzoides*
- c *Chrysopogon aciculatus*
- c *Lycopodium complanatum*
- c *Scaevola frutescens*
- c *Geniostoma*
- c *Gleichenia linearis*
- o *Casuarina equisetifolia*
(large on edges of steep slopes)
- o *Heteropogon contortus*
- o *Wikstroemia elliptica*
- o *Melastoma malabathricum*
- o *Timbristylis annua*
- o *Scleria (small) (under casuarina)*
- o *Cheilanthes tenuifolia*
- o *Glochidion marianense*

- ~ Euphorbia serculata?
- ~ Hyptis capitata
- ~ Dianella
- ~ Ipomoea (small purple)
- ~ Casaytha filiformis

Small bit of ravine forest to south, examined only from distance.

- dominate {
- Antocarpus altalis
 - Pandanus tectorius
 - Areca cathecu
 - Ficus prolixa?

Jan. 5 6 km. W. of Pago Bay
fairly large flat-topped
remnant of mesita, south
of road.

Main vegetation on top
is a mixture of Miscanthus
and Dimeria - obviously
rather disturbed.

- a Miscanthus floridulus
 - a Dimeria chloridiformis
 - a Chrysopogon aciculatus
 - la Mitracarpum hirtum
 - a Stachytarpheta indica
 - c Scaevola frutescens (on scarp)
 - c Gleichenia linearis (on scarp)
 - c Claphantopus mollis
 - c Andropogon fragilis
 - o Hyptis capitata
 - o Casuarina equisetifolia
- (older ones around edges,
a few seedlings on flat)

- o Wikstroemia elliptica
- o Waltheria indica
- o Fimbristylis sp.
- o Geniostoma
- o Ligeratum conyzoides
- o Morinda citrifolia (on scarp)
- o Curculigo orchroidea?
- ~ Myrtella benningiana
- ~ Glochidion marianense

Between these mesitas
there are rather conspicuous
flat or very nearly flat
areas at somewhat lower
elevation. These surfaces
might be mistakes
for the same surface as
that of the mesita. It
apparently results from
a type of erosion which,
cutting into the mesita
laterally, removes a
sheet a few m. thick
leaving an almost flat
residual surface. This
may possibly be the way
the original flat reef
deeply weathered surface
became flat. Apparently
some of the pyroclastic
materials, possibly only
the loess, weather very deeply
to form a ~~series of~~ clays
that ~~weather~~ erode

in this manner, regardless of the bedding or other orientation of the original material. This erosion also seems to expose ~~some~~ clay surfaces in the scars that tend somewhat to resist revegetation. The material removed in the erosion may go, at least in part, to make up the lens-shaped bodies of bedded red fine material found so commonly here. If so, then this bedded material may well date from the time deep clay weathering started right up to the present time.

The oldest casuarinas in any of this region, not large, but rather gnarled and wind-beaten up to 2(-3) dm. thick, 9-10 m. tall, are generally found on the edges of these mesitas. They may well date to before the war. They are probably protected from fire by the steepness and barrenness

of the eroding sides of the mesitas and scars surrounding them. These probably provided the seeds for the abundant crop of saplings that occur scattered over the entire country here on the volcanoes (where they have not been destroyed by fire).

The ground beneath these casuarinas is covered by a layer of dead "needles" and seems to have rather resistant vegetation. *Salvia* (small) seems to prefer this habitat, and *Riveria* and several other grasses and sedges are able to invade it, but more slowly than on bare soil.

juncos

Jan. 6 - Mt. 1 km. s.e. of
Jumufong Mangro Mt.
Gently rolling ^{partly} slope
of deeply weathered
volcanic material.

35367

Belaginelia ciliaris (Retz) Lpr.
vertical banks of large
erosion scar, north exposure.

5

68

Dimeria ornithopoda
vertical banks of large
erosion scar

1

69

Wedelia biflora var. *canescens*
occasional on erosion scar

4

70

Stenoloma
~~occasional~~ common on
erosion scars.

2

71

Dryopteris maenensis
edge of patch of
woods in ravine.

10

72

Cyathea lunulata
occasional in ~~both~~ heads
of ravines in patches of woods

5

73

Hedyotis megalantha Merr.
common in grassland
near edge of woods

5

74

Oplismenus imbricatus
carpeting ground in
edges of patch of wood in ravine

2

75

Cenchrus ciliaris
occasional in edge of
patch of woods in ravine

5

76

Antrophyum plantaginifolium (Thunb.)
epiphytic on tree trunk in
wooded ravine.

325 m

prostrate, leaves
gray-green; heads yellow.
fronds coriaceous.

erect trunk 1 m. tall
(others up to 4 m.), about
2 cm. diam. leaves up to
~~1.5 m. long~~ 1.5 m. long.
small shrub up to 1 m.
tall; fls. white.

prostrate.

culm erect

blades arching downward,
leathery.

- 35377 *Peperomia*
2 epiphytic in knot hole
on tree trunk in wooded ravine.
- 3 78 *Premna obtusifolia* A. DC. (obtus. lvs.)
medium tree in
wooded ravine
- 3 79 *Melochia*
common around edges
of patches of woods in ravine
- 79a *Phyllanthus saffordii*
common around edges of patches of woods in
ravine
- 4 80 *Digitalis purpurea* var. *purpurea* but
patch around old approaching
installation on summit.
- Jan. 6 Mt. Jannafong Manglo
3 mi. north of
Jan. 7 - ~~Wetengel~~ junction
- low place on ~~rather~~
~~thin~~ limestone soil
- 4 81 *Rottboellia Tripsacum latifolium* Hitchc.
large patch, not seen
elsewhere.

Jan. 7 - Northwest Field

decadent forest on
limestone plateau.

- 7 82 *Erigeron annuus*
local colony on roadside
- 83 *Hedyotis*
along roadside

35378 leaves fleshy

medium tree, leaves
and flowers aromatic,
flowers pale green.
shrub 2 m. tall,
leaves with a
frosted appearance;
flowers magenta.

380 m.

ca. microbalme

tangled decumbent to
ascending culms.

115 m.

1-2 m. tall, from
creeping superficial
rhizomes.

195 m.

150 m.

caespitose,
stems erect from large
clumps of rosette leaves.
flowers white

185 m.

35384 *Operculina*
8 around edges of forest

4 85 *Columbina asiatica*
edge of forest

6 86 *Lepturus repens*
along sides of road
and in edges of forest

2 87 *Ipomoea indica*
along roadside

1 88 *Ipomoea indica*
along roadside

6 89 *Claoxylon*
edge of forest

2 90 *Eugenia javanica*
in secondary forest

177m. tremendous vine,
blanketing trees and
shrubs, flowers white
anthers spirally coiled.

185m. tangled scandent
shrub, flowers yellow-green,
fruits immature.
forming a continuous
loose mat.

twines, flowers
purple, fading in
late afternoon.
extreme leaf variation
small tree, 10 m. tall.

small tree. ~~flowers~~

Jan. 7 - Anderson Field

In base nursery, cultivated

75371 *Catalpa longissima*x 92 *Albizia*4 93 *Phaseolus lunatus*2 94 *Pseuderanthemum**carnuthensis* ^{Seem.} _{var.} *carnuthensis*2 95 *Pseuderanthemum**carnuthensis* var. *atropurpureum* (Bull.) Focke2 96 *Morus*1 97 *Alpinia* 2

Jan. 7 Yigo

~~area~~ cultivated in garden
of Manuel Calvo1 98 *Zephyranthes candida*
border plant1 99 *Polyscias*1 35400 *Asparagus sprengeri*
not plant1 01 *Coffea liberica*

160 m.

flower white.

climbing on trellis,
flowers white.- leaves green, flowers
white with red
spots in throat.- leaves deep maroon
beneath, orange green
above, flowers deep
pink with numerous
red dot on upper side
of limb.- leaves very young.
caespitose, canes 1.5 m.
tall, calyx and corolla
white tipped with
rose. stamens red
with yellow margin.

170 m.

flowers white.

shrub 1 m. tall,
aromatic.- caespitose, stems
arching; flowers white.
- tree 3 m. tall, only 4
years old, fruit green.

35402 *Diospyros discolor*
 2 tree ~~10 m. tall~~

1 03 *Cupressus*

1 04 *Maranta arundinacea*

1 05 *Moribot glaziovii* M.H.

2 06 *Pterocarpus indicus*

47

Jan. 7 Between Wattedgel
 Junction and Yigo

1 07 *Triumfetta semitriloba*
 roadside

Sasa

Jan. 8 Lasa Valley.

2 08 *Lygodium circinatum* v. *semihastatum*
 rare on brushy side of ravine.

12.111

tree 10 m. tall; leaves
 glaucous beneath;
 fruit said to be edible.

small sapling;
 branches spreading
 horizontally.

flower white.

tree 10 m. tall, sterile,
 "rubber tree".

tree 15 m. tall, very
 wide-spreading;
 introduced from the
 Philippines.

120 m.

much branched bushy
 herb 1.5 m. tall, partly
 chlorotic (one half of
 plant); flowers yellow.

20 m.

vine tangled in brush,
 half dead.

Jan. 8 - $3\frac{1}{2}$ miles s. of Agat

- 35409 weedy edge of dump
Malachra
 rare in flat weedy ground
 5 10 *Luffa cylindrica*
 large patch

Chalandao

Jan. 6 - Mountain 1 km.
 s.e. of Jumbo Manglo
 (see p. 23)

This is a gently sloping
 rolling relatively
 level top, grassy
 except for large erosion
 scars and shallow
 ravines eating into
 it from the lower edge.

These ~~patches~~
 ravines have patches
 of low woods, usually
 connected with larger
 patches or areas of
 woods below.

The scattered *Melochia*
 bushes around the
 edges of these patches

100
 100
 100

erect plant with stinging
 hairs; flowers yellow.
 extensive branching
 vine, loosely covering
 ground; corollas yellow,
 very readily caducous.
 fruit round in section,
 very warty, eaten when
 green. Vines cooked and
 eaten, but rather bitter.
 "almagosa"

suggest that the
 original habitat of
Melochia hirsuta may
 have been around
 the borders between
 wood and savanna.

Composition of forest in
 upper ends of ravines.
 Tree layer (ind. shrubs)

- a *Pandanus tectorius*
- la *Acacia catenata*
- la *Hibiscus tiliaceus*
- c *Ficus prolixa*
- c *Tournefortia*
- c *Genivatomia* (edges)
- c *Cycas circinalis*
- c *Pernona obtusifolia*
- o *Musa* (edges)
- o *Morinda citrifolia*
- o *Melochia*

- o *Epiphyllum phyllanthoides*
 c Epiphyte and climber
 c *Freylinia torresiana*
 o *Medinilla rosea*
 o *Lygodium scandens*
 o *Polypodium punctatum*
 c *Davallia solida*

Herb layer:

- c *Nephrolepis ~~to~~ humilis*
 c *Heliconia* (large)
 r *Andropogon erectus*
 o *Centotheca lappacea*
 lc *Oplismenus imberbis*
 c *Alocasia macrorrhiza*

Some reed patches in
ravines between
patches of forest.

The *Cyathea* occurs
principally as scattered
individuals in the
edges of the upper
parts of the ravine.
About 10-12 individuals
were seen in about 4 ravines.

Grass communities
on level to rolling areas:
Dimorphia chloridiformis
is dominant on most
of the more level places.
Miscanthus invading
actively in some places.

than not, as shown by
an abundance of
young plants scattered
here and there in the
Dimorphia communities.
On slopes, ravine walls,
etc. *Miscanthus* is
dominant and even
exclusive.

Secondary species
here, mostly in both
communities:

- lc *Gleichenia linearis*
 lc, c *Elephantopus mollis*
 c *Lygodium scandens*
 c *Hedyotis megalaantha*
 c *Malabaricum malabaricum*
 c *Chrysopogon aciculatus*
 c *Hypochaeris capitata*
 c *Phyllanthus saffordii*
 lc, c *Sindsaya ensiformis*
 lc *Mitrasacrum hirtum*
 lc *Cheilanthes tenuifolia*
 lc *Rhynchospora corymbosa*
 lc, o *Centella asiatica*
 lc *Andropogon fragilis*
 o *Glochidion malabaricum*
 o *Dianella*
 r *Wibetostoma elliptica*
 r *Stachytarpheta indica*
 r *Myrtella bennigseniana*
 l *Oplismenus imberbis* (also seen)
 l *Helagrella ciliaris*
 (see also p. 30)

Erosion scars in this area are mostly at and just back of the crest, sometimes actually draining to the uphill side through narrow notches. They are cut into weathered fine pyroclastic material. They are typically rolling to absolutely flat-bottomed, actually appearing to be artificially levelled in some cases.

~~In places~~ They have evidently been scooped out by wind as well as water. Usually the bottoms are completely without plants.

In places material washed from the sides of the scars spreads itself out ~~in~~ over these flat places or in depressions in ~~the~~ level bluffy fine beds. These tend to build their own dams, or at least to maintain a level.

Jan. 7 - Yigo
called on Manuel Calvo, commissioner of Yigo and local gardener. Asked various questions and discussed place to set aside as conservation reserve.

He suggests the area south of Anas Pt. and Anderson Field and east of Yigo, east of the line of private property - east of Perez property (lot 7090), Blas property, south to the 7100 plot, 7032 plot, and 7092 plot. This is reasonably good woods, and protected on 2 sides by ocean and airport base. Property owners are favorably disposed. Contains roosting places of fruit bats.

Calvo says that in former times the natives made sweet potatoes bear better by beating the vines with sticks to injure them.

They also discovered that mango trees can be made to blossom by smothering them several

1994 7

times or separate days.
This was apparently
arrived at by observing
behavior of trees around
cook houses, etc. where
there is much smoke.

When cook houses are
abandoned trees nearby
do not bear the next
year.

Calvo said that when
he was younger, a
cook house had been
out of use for 15 years.
Mango trees which
had borne well before
did not bear much
during the ten years
but started again
when cook house
was used again.

Smoking for mosquitoes
is very common. Sometimes
smudge fires are built
under houses elevated
on pilings. Pajo (*Hibiscus*
tiliaceus) usually used.
An old log 10 feet long
will burn very slowly,
making smoke for
10 days or so.

Calvo says that
20-30 years ago there
was much clearing

between Agaña and
Yigo, some clearings
planted to coconuts,
some to other crops,
then abandoned and
grown up to forest
of trees perhaps 2-3 dm.
thick.

Also in former times
there was much logging
for ifil, agos, pandas,
dugding and fogs. Trees
were removed up to
500' from the roads on
smooth ground. Some
of the old wood roads
were built for this
purpose.

He remembers
planting of teak trees
in 1925. They are now
about 5 dm. in diam.

"paipai" (*Guamias*) wood
is used for forins handles.
"alumi" (*Melanolepis*) wood
is used for shot lasts.

"lador" (*Morinda citrifolia*)
wood used for rafters.

Plants cultivated
in Calvo's garden:
Nopalea cochinellifera
Delonix regia
Persea americana (various sizes)
Barleria cristata

Catharanthus roseus
Codiaeum variegatum
Vanda Miss Joaquim
Allamanda cathartica
 var *benderosii*
Bougainvillea spectabilis
Hibiscus hybrid
Plumeria rubra
Citrus pinnensis
Caesalpinia pulcherrima
Averrhoa bilimbi
Averrhoa carambola
Zephyranthes candida
Psephenobachia maculata
Araucaria excelsa
Leucodaphnys aurea
Mangifera indica
Canna hybrid
Antigonon leptopus
Diospyros discolor
Epipremnum?
Asparagus sprengeri
Asparagus plumbeus
Chamaecrops?
Tabernaemontana divaricata
Besleria ovata
Cordyline terminalis
Rosa sp.
Cassia javanica
Nerium oleander
Yucca sp.
Cupressus sp.
Coffea liberica
Punica granatum

Zoysia tenuifolia
Citrus medica (line)
Begonia sp.
Polygonum tuberosum
Zephyranthes rosea
Acalypha amentacea v. *altissima*
Caladium bicolor
Hedycheium coronarium
Hedycheium flavum
Psidium guajava
Polyscias frutescens v. *fragilis*
Polyscias scolymifolia
Annona squamosa
Canna (large spp.)
Carcuma domestica
 (look for it)
Alocasia macrorrhiza
Musa paradisiaca
Musa nana
Maranta arundinacea
Carica papaya
Terminalia catappa
Xanthosoma sagittifolia
Monstera deliciosa
Plumbago ~~auriculata~~
~~Morinda tomentosa~~
Celosia argentea
Annona muricata
Pterocarpus indicus "nan"
Spathoglottis campanulata
Rantana canary
Cacuarina equisetifolia
 says that the big 3 dimensional
 orb-weaver spider was not
 noticed before about 1946.

Jan. 7 - Anderson Airforce
Base nursery.

Plants observed - mostly
nursery stock:

Hibiscus hybrids.

Phaseolus lunatus

Polyscias frutescens v. *picifolia*

Scindapsus aureus

Phyllanthus niruri

Antigonon leptopus

Zinnia elegans

Cassia alata

Tithonia speciosa

Catharanthus roseus

Kalanchoe pinnata

Rubra angulata

Coreopsis sp.?

Caladium bicolor

Flerodendrum speciosum

Polyscias guilfoylei

Spathodea campanulata

Acalypha amaranthacea v. *arabica*

Barleria cristata

Coleus scutellarioides

Angelonia angustifolia

Alternanthera versicolor

Delonix regia

Albizia sp.

Codiaeum variegatum

Catalpa longissima

Morus sp.

Citrus sp.

Casuarina equisetifolia

Bougainvillea spectabilis

Tabernaemontana divaricata

Bauhinia sp.

Nerium oleander

Solanum lycopersicum

Alpinia spectabilis

Brassica sp. (low tree, green,
very much crinkled leaves)

Pedilanthus tithymaloides
(both green and

variegated forms -

do not flower at

same time)

Saccharum officinarum

Thespesia populnea

Jatropha multifida

Gephyranthes candida

Canna hybrid

Samanea roxburghiana

Polyscias scolotheca

Jan. 7 - West and north
of Northwest field.

Vegetation of a thick
mixed shrub layer
2-4 m tall, as in abandoned
clearings. Taller trees
scattered through this,
various species, mostly
dead or at least the top
dead, standing conspicuous
white above the green
layer. Possibly dying from
exposure, as most of
forest must have been cleared out.

1954 Guam.

Jan 3 - Mt. Makeyos,
ridge south of Fort R.Examined several
mesitas, especially the
transition from structureless
red material above to
weathered tuff below
which preserves its structure.One shows fairly
definitely a transition
from one to other.Another seems to change
rather abruptly.One shows a bedded
series 2.5 m thick, of
unconsolidated material -
bedding becoming flatter
and number of large
particles greater downward.
Red color less pronounced
downward. No beds
really free from larger
fragments (2-10 cm), less
above. Color may have
been washed down from
red cap further up hill.Jan. 3 - Lasa Valley,
about Agaña.Here, a thick layer of
rather fine, loose, loose-
bedded alluvium, red
in color, a bit toward orange,
lies unconformably ona heavy green clay of
1.5 m. or more thickness.
Contact is irregular,
with clumps of alluvium
included irregularly
in upper layers of clay.
Very numerous thin
discontinuous layers
of carbonaceous material,
apparently mostly sedge
stems - some collected.
Also a well preserved seed
or small dry fruit.This material is at
least 6-8 m. down,
yet has many root
holes, some even with
recognizable remains
still in them. There are
certainly modern while
the carbonized remains
are contemporaneous with
the clay. Around these
root molds clay is
oxidized to red brown
or yellow brown.Jan. 3 - Prominent
Mesita several km.
S. of Agaña.Here slumping is
very prominent, because
there is some deep
gullying.

Here the upper 5 dm. 2 of the actual mesita is red, light brick red. Then, a short break, and a darker red color with many apparently charred spots going so deep that being ~~burned~~ by fire is unlikely.

Origin of lighter upper layer seems to be from material whisked up the steep sides of this mesita by the strong wind. Noticeable quantities in air, enough to feel on bare skin and especially in eyes.

Jan. 9 - Road from Pago Bay to Umatas, by car.

Around Pago Bay area *Leucaena* very abundant. Some *Nipa* swamp back of bay.

South of this on low coasts *Casuarina* is abundant, locally dominant, large trees.

Coastal strip, especially on south, planted to coconuts. Along a part

of this coast are limestone rocks, formerly forested with *Pandanus*. Cleared ~~of~~ *Pandanus* by typhoon in 1949. Now *Pandanus* is continuous but very low and mat-like.

In the 1st Coconut plantation which, in the Merizo region and eastward, lie on the sandy coastal strip fringing the volcano, have a vigorous growth of banana between them.

The beaches in and east of Merizo are covered with a sod of *Paspalum vaginatum*.

Jan. 10 - Umatoc

Hills right down to back of town are covered by *Miscanthus*, or if recently disturbed, by weeds. Casuarina trees are scattered unevenly over these hills. In the ravines and valley bottoms are thickets, especially *Bambusa* ^(Bambusa) and breadfruit.

The broad relatively level valley bottoms are pastured or, apparently uncommonly, cultivated.

Toward the heads of the valleys, where the slopes begin to steepen, there is a black soil about 3 dm. deep, lying on a yellowish brown partially weathered rock. This is badly slumped in places.

On these slopes the people attempt to cultivate tomatoes, but have trouble with a coccinellid that eats the leaves.

The steep slopes at the heads of the valleys are wooded, principally

with *Artocarpus* (climbing), *Hibiscus* ^(papaya) *tiliaceus*, *Ficus* *prolisa* (mamm) and both species of *Pandanus*, *P. dubius* (framing) and *P. tectorius* (kapa) with, at least lower down, some *Areca cathartica*. Coconuts common on lower slopes, also breadfruit (edible), and *Cycas*.

In these valley heads is much broken pottery, and there were formerly some latrines, but these have disappeared (acc. Joe Santiago). Pottery occurs in black soil.

Open fields here, when not cultivated, are dominated by *Elephantopus mollis*, *Hypochaeris capitata*, and *Stachytarpheta indica*.

Information from
Joe Santiago:

Betel nut:

There are two kinds, indistinguishable except that one has the endosperm red and

the young roots reddish inside, the other has the endosperm yellowish and the young roots whitish within. There is a difference in the quality for chewing.

The endocarps of both turn red at maturity. They are chewed when green, red, or dry or sprouted. Preferred when red. A gunny sack full brings \$1.50 in the market. (There are differences are real, as he showed them to us)

Alocasia macrorhiza
= "papaia"
inedible

Alocasia sp.
= "piga" edible.

Colocasia esculenta - "paciencia"
because it bows before the wind or when stepped on and is erect again next day. Only purple stemmed form seen.

Xanthosoma - Hawaiian tub.

Adonis mercurii,
cult. as street tree in

village, is sometimes used as a substitute for breadfruit.

Only two kinds of bamboo - ordinary one (*Bambusa vulgaris*?) and a spiny one.

Curcuma domestica
"Mango" (soft) is used in food.

Curcuma sp.
"Mango galantano"
is wild one with rose bracts.

Breadfruit season is April to August, with some till October.

Dugong has harder, ~~other~~ wood than breadfruit and lasts longer. Excellent wood if ~~kept~~ used out of contact with moisture.

Cycas circinalis (federica)
nuts were an important food during the war. They are cracked and pounded up, soaked for eight days in fresh water, changing water every day, to remove

the poison, then made into a flour for bread and cake. Those in southern Guam are smaller than those on the northern plateau. I recognized one I had in my bag for a northern one.

Casuarina = "gagu"

Leaevola = "navasii"

~~Cassia~~
Cassipourea = "mayagasi" which is used medicinally - boiled with flowers of another plant, "Momonong palawan", the liquid drunk for fatigue.

The ~~the~~ mountains south of Jumulang Mangro are, in order, Chalandao, Chalan Palii, Nala, Bolanos, ~~the~~ Schroeder.

The strand north of Umatac has a terrace of rough coral, extraordinarily uniform in height, about 1 m. above the reef flat. This is covered by a low growth of *Pennisetum*

mostly dead at the tops and sprouting vigorously from the lower parts, 3-4 dm. tall. ~~Between the terrace and the foot of the cliffs~~
In places there is sand between the patches of coral. This has a sod of *Paspalum vaginatum*.

Between the terrace and the foot of the cliffs is a beach, usually of boulders but in places sand. Growing here ~~are~~:

- c *Thespesia populnea*
- c *Casuarina equisetifolia* (trees to 10 m. high, lengths 10 m.)
- c *Ipomoea pes-caprae*
- c *Vernonia cinerea*
- c *Cenchrus glauca* (small seedlings only)
- lc *Pandanus tectorius*
- lc *Stachytarpheta indica*
- lc (comp.)
- c *Ageratum conyzoides*
- c ~~the~~ *Euphorbia hirta*
- c *Panicum*
- c *Vigna maritima*
- c *Hedyotis albida-punctata*
- c *Clerodendrum inornatum*

On the cliffs above

are

- a *Triphasia trifolia*
- la *Leucaena glauca*
- c *Casuarina equisetifolia*
- c *Cassytha filiformis*
- lc *Vernonia cinerea*
- lc *Ageratum conyzoides*
- l *Scaevola frutescens*
- l *Passiflora foetida*
- o *Pisonia obtusifolia*
- o *Miscanthus floridulus*
- r *Cycas circinalis*
- r *Carica papaya*

Jan 10 - Umatas, ~~in~~
~~common~~ water point,
 base of cliff at head
 of valley

Disturbed wooded ground

75411
4.

~~from~~ *Cassiopea* *capitata*
 common along roadside
 in bare ground.

- 12 Piper betle
 climbing on tree, common

Jan. 10 - Umatas
 along strand, above
 high water

6 13

local but fair sized colony

100 m.

erect herb, to 1 m tall,
 flowers bright red.
 said to have been brought
 by Japanese for pot-herb.
 sterile vine with
 acid odor when crushed;
 wrapped around betel
 nut with lime and
 tobacco for chewing.

1 m.

flowers lavender.

35414 *Panicum*

6

common on beach and lower part of cliffs

1 15 *Hedyotis albida* - punctata on rocks at top of beach2 16 *Phyllanthus wingatus* Forst. f. among rocks3 17 *Phyllanthus* ^{amarum Schum. & Th.} ~~amarum~~ ^{det. G. L. Webster} common among rocks

same - along road

3 18 *Panicum* near cement wall5 19 *Abutilon* around culvert where stream goes under road

Jan. 11 - Umatac - along strand above high water

1 20 *Hymenocallis littoralis* most abundant around fresh water seeps, top of beach.3 21 *Lantana camara* L. one plant in thicket at top of beach near old house.6 22 *Lepturus repens* var. *subulatus* Forst. f. at top of beach and on rock ledges just above.1 23 *Digitaria* at top of beach3 24 *Hedyotis caputata* Jacq. at foot of cliffs, in slumped earth.

small tufts, strongly spreading.

(Hilleb.) Forst. plant depressed, spreading; leaves not fleshy, leaves closing near sundown.

1955 erect herb, leaves glaucous beneath.

1-3 m erect to prostrate

erect bush 1.5 m. tall, flowers orange yellow, not opening fully, many young fruits caducous.

1-3 m.

peduncles compressed, flowers white.

shrub 1 m. tall; flowers bright yellow.

forming loose mat from primary tufts.

erect, sparsely branched, leaves dark green; flowers white.

35475 *Amaranthus viridis*
 on beach around drain
 from dwelling

South of Umatac the strand is similar to that to north except that the 1 m. limestone platform is cut into much more of a karst field, part of it actually missing. Covered by *Pemphis*, not so noticeably dead as to north of town, but still with tops dead and cut back to about 1 m. or less.

On the beach: are mats of *Paspalum vaginatum*, some *Vigna marina*, *Ipomoea per-capuae*, and at the top, shrubs of *Desmodium umbellatum*, trees of *Casuarina equisetifolia*, *Hernandia sonora*, and *Thespesia populnea*. At the top of the beach beach is *Hymenocallis littoralis* especially around fresh water seeps.

Otherwise no signs of any special vegetation around such seeps. *Paspalum* may be more luxuriant here

A little
Ipomoea per-capuae
 at the top

On the cliffs is a dense scrub, principally *Triphasia trifolia*, but with *Scaevola*, *Miconia*, *Pandanus*, *Prunna* and *Rauvolfia* locally important, and with scattered *Casuarina* trees. Herbs are *Polypodium scolopendria*, *Vernonia cinerea*, *Pyrostachys lanceolata*, *Hyptis pectinata*, *H. capitata*, *Ageratum conyzoides*, *Neptrolepis hirsutula*, and *Cassytha*. *Cycas* is occasional.

These cliffs are of volcanic breccia, but with seams and cracks filled with limestone.

Jan. 11 High land south
to southeast of Umatac.
south of main cliffs.

(1) Eroded slope of dark
brown soil.

- a. *Dimeria chloridiformis*
- a *Waltheria indica*
- c, la *Stachytarpheta indica*
- c *Heteropogon contortus*
- c *Rhynchospora corymbosa*
- c *Cantharospermum scarabaeoides*
- c *Hypis suaveolens*
- c *Hypis capitata*
- c *Cassytha filiformis*
- c *Fimbristylis* sp.
- c *Fimbristylis* sp.
- c *Chrysopogon aciculatus*
- c *Miscanthus floridulus*
- c *Mitracarpum hirtum*
- c *Centella asiatica*
- lc *Phyllanthus virgatus*
- o *Phyllanthus saffordii*
- o *Andropogon fragilis*
- ~ *Cheilanthes tenuifolia*

some open ground
is exposed here, but
not enough to call it
an erosion scar.

- a *Cheilanthes tenuifolia*
- a. *Tacca leontopetaloides*

(2) On weathered knobs
of greenish volcanic
breccia, recently rather
seriously burned over,
plant cover incomplete.
Shrubs mostly just
sending shoots out
from base.

- a *Heteropogon contortus*
- a *Waltheria indica*
- c *Casuarina equisetifolia*
- c *Dimeria chloridiformis*
- c *Rhynchospora corymbosa*
- lc *Curculigo orchioides*
- lc *Dianella*
- lc *Pandanus tectorius*
- lc *Andropogon fragilis*
- lc *Stachytarpheta indica*
- lc *Hypis suaveolens*
- lc *Chrysopogon aciculatus*
- lc *Phyllanthus virgatus*
- lc *Lindsaya ensiformis*
- o *Scleria (small?)*
- o, lc *Eugenia bryanii?*
- o *Scaevola frutescens*
- o *Fimbristylis* sp.
- o *Fimbristylis* sp.
- o *Rhynchospora rubra?*
- ~ *Morinda citrifolia*
- ~ *Timonius*
- ~ *Fimbristylis cynnora*
- ~ *Triphasia trifolia*
- ~ *Phyllanthus saffordii*
- ~ *Emilia javanica*

(3) Rather heavily grazed pasture on flat to rolling dark soil.

- a Hyptis suaveolens
- a Chrysopogon aciculatus
- ~~a~~ a Waltheria indica
- ~~a~~ a Rhynchospora corymbosa
- la Rhynchospora rubra?
- la Stachytarpheta indica
- c Dimeria chloridiformis
- lc Hyptis capitata
- lc Centella asiatica
- o Miscanthus floridulus
- o Lindsaya ensiformis
- o Fimbristylis (large headed)
- o Cassytha filiformis
- n Cheilanthes tenuifolia
- r Paspalum orbiculare
- r Phyllanthus saffordii
- r Casuarina equisetifolia
- r Ipomoea littoralis
- r Mitrasacrum birtum
- r Elephantopus mollis

(4) grassy flat tops of erosion remnants with red soil. Thick grass here is badly overgrazed on most of these.

- a Miscanthus floridulus
- a Chrysopogon aciculatus
- la Gleichenia linearis
- la, o Elephantopus mollis
- la, o Mitrasacrum birtum

- c Phyllanthus saffordii
- c Dimeria chloridiformis
- c Waltheria indica
- c Emilia javanica (around on dung)
- c Rhynchospora corymbosa
- c Centella asiatica
- c Cassytha filiformis
- lc Wikstroemia elliptica
- lc Triphasia trifolia
- lc Curculigo orchioidea
- o Sesuvola frutescens
- o Melastoma malibathrum
- o Hyptis capitata
- o Hyptis suaveolens
- o Pandanus tectorius
- o Stachytarpheta indica
- o Lindsaya ensiformis
- o ~~gl~~ Vernonia cinerea
- r Glossogyne tenuifolia
- r Glochidion marianum
- r Lygodium scandens
- r Casuarina equisetifolia
- r Psidium guajava
- r Decaspermum fruticosum

Grazing on some of these areas has greatly increased Mitrasacrum and Elephantopus, as well as some other things is. Stachytarpheta Hyptis suaveolens Waltheria indica

(5) same as 4 but on
badly eroded areas,
sides, etc. Mostly
bare red soil, some
of it partially revegetated.

- a *Gleichenia linearis*
a *Chrysopogon aciculatus*
c *Miscanthus floridulus*
c *Andropogon fragilis*
lc *Timonius*
lc *Dianella*
la *Heteropogon contortus*
lc *Centella asiatica*
lc *Waltheria indica*
lc, la, *Mitracarpum hirtum*

Jan. 11 South to southeast
of Umatas

high grassy ground.

- 35426 *Heteropogon contortus*
5 in somewhat eroded grassland
1 27 *Fimbristylis*
eroded grassland
2 28 *Digitaria ciliaris*
rare in eroded grassland
4 29 *Fimbristylis annua* var.
common in eroded grassland
5 30 *Wikstroemia elliptica*
occasional on eroded
volcanic breccia
3 31 *Eugenia bryanii*?
common on eroded knobs
7 32 *Andropogon fragilis*
common on eroded ground

lc, r. *Stenoloma*

- o *Casuarina equisetifolia*
o *Pandanus tectorius*
o *Scaevola frutescens*
o *Phyllanthus saffordii*
o *Smilax javanica*
l *Hedyotis laciniosa*
r *Ipomoea littoralis*
r *Glochidion maurusanum*
r *Myrtella bennigseniana*
r *Wikstroemia elliptica*
r *Fimbristylis annua*?
r *Blechnum orientale*
r *Stachytarpheta indica*
r *Cheilanthes tenuifolia*

77-101%

caespitose

~~scarcely~~ caespitose

shoots from burned off
bush; flowers greenish
yellow.
sterile bushes, recovering
from burning.

- 35433 *Curatiga orchivides*
common locally in grassland
- 5 34 *Fimbristylis schauinslandii* var. *foenea* (Kuhn) Fock.
common locally in grassland
- 3 35 *Dianella*
common locally in eroded
places in grassland
- 6 36 *Waltheria indica*
locally abundant
in disturbed places.
- 1 37 *Euphorbia*
rare in somewhat
eroded grassland.
- 5 38 *Mitracarpum*
abundant in overgrazed
and disturbed spots;
grows on bare soil.
- 4 39 *Hedyotis laciniata*
common very locally
in grassland
- 1 40 *Ipomoea littoralis*
rare in grassland
- 402 *Emilia javanica* (Purum.) Pol.
Jan. 11 - s. e. of Umatac,
about 1 km.
densely wooded ravine
- 1 41 *Dioscorea*
local in woods
- 5 42 *Belvisia*
epiphytic on tree trunks
- 5 43 *Balanophora*
common, parasitic on
a. s. *Triphasia trifolia* roots
b. s.

80-100m

flower bright yellow.

) Fock.

in small patches; flowers
whitish; fruit immature

flowers yellow.

erect; flowers white

leaves yellow-green,
aging purplish; flowers
white, hairy within;
flower purple.

90m.

around cowdung. Fls. red.

not certain that spiny
roots and vine are
connected. Vine mostly dead,
margins wavy.bright pink bracts and
staminate flowers, pistillate
deep carmine to brownish

The forest in this ravine is dominated by *Artocarpus altalis* (both forms), and has an almost impenetrable understory of *Triphasia trifolia*. On the ground beneath *Balanophora* is abundant, as well as *Oplismenus*. The height varies with the depth of the ravine, but is up to 25 m.

Composition, roughly:

- a *Artocarpus altalis*
- a *Oplismenus undulatifolius*
- a *Triphasia trifolia*
- c *Pandanus tectorius*
- c *Scaevola frutescens* (edges)
- c *Morinda citrifolia*
- c *Carica papaya*
- c *Balanophora*
- o *Pandanus dubius*
- o *Cycas circinalis*
- o *Areca cathecu*
- o *Musa* sp.
- o (Urticaceae)
- o *Freyzinetia toresiana*
- o *Hibiscus tiliaceus*
- o *Geniostoma*
- o *Pisonia*

- o *Glochidion marianum*
- o *Tectaria crenata*
- o *Polypodium punctatum*
- o *Belvisia*
- o *Davallia solida*
- o *Dioscorea*

Even with a sharp machete progress through the upper parts of this ravine forest is a slow and painful process. The easiest way in some places is to crawl on one's knees between the trunks & stems, but this is made hazardous by the wicked spiny roots of the *Dioscorea* that lace the bushes with its tough prickly vines. These roots lie in spiny clusters at the surface of the ground, among the leaves.

- 35444 *Areca cathecu*
2 large grove in valley bottom.

~~Merizo~~

Jan. 12 - Merizo Annex
Pandanus savanna

45

rare in weedy grassland

Jan. 12 - Umatac

- 2 46 *Adonidia merrilliana*
cultivated along street.

Jan. 12 - Merizo Annex
Savanna land stretches
from Merizo Annex
Village to the slopes of
Mt. Schroeder, which
are largely covered by
patches of ravine type
forest.

The savanna area
is generally level to

- 48 m. tree 4 m. tall; sheath of
leaf closed; pinnal
with 2 and 3 folds
irregularly alternating;
fruit immature, endosperm
dull orange yellow in
color. Fruit cluster
at 3rd node below leaves

90 m.

flower bronze green.

11 m.

Tree 3-4 m. tall; sheath
of leaf closed, splitting
at maturity; fruit
scarlet when ripe.
"Chinese betel nut" used
as substitute for betel,
especially by children.

rolling, with one or
two shallow ravines
with reeds, and a
large black lava(?)
knob. Examined
this area with view of
delineating a conservation
reserve. This, as
planned, includes
the peak of Mt. Schroeder.

with its steeper slopes on all sides and the valleys of ~~the~~ Halayuan and Fanaihung, stretching down toward Umatac and Merizo down as far as the line of black rocks south west of the lava knob mentioned above. This includes both level and steep savanna, eroded and depositional areas, and ravine and steep slope forests.

Pandanus savanna - weedy grassland, burned not too long ago, with scattered Pandanus rather abundant.

This area has been greatly disturbed but is mostly being reclaimed by *Miscanthus*, in more level places by *Dimeris*.

- c, la *Dimeris chloridiformis*
- la *Miscanthus floridulus*
- la *Stachytarpheta indica*
- c la *Elephantopus mollis*
- c *Sida acuta*
- c *Hyptis capitata*

- c *Waltheria indica*
- c *Emilia savana*
- c *Heteropogon contortus*
- c *Fimbristylis annua*
- c *Pandanus tectorius*
- lc *Glossogyne tenuifolia*
- lc *Phyllanthus saffordii*
- c *Vernonia cinerea*
- c *Euphorbia hirta*
- c *Mitracarpum hirtum*
- c *Cassytha filiformis*
- lc *Chrysopogon aciculatus*
- lc *Centella asiatica*
- lc *Leucaena frutescens*
- c *Lecanodermis triflorum*
- c *Glochidion marianum*
- c *Paspalum orbiculare*
- c *Fimbristylis*
- c *Hyptis suaveolens*
- r *Cheilanthes tenuifolia*
- r *Zinnia*
- r *Psidium guajava*
- r *Phyllanthus virgatus*
- r *robil.*

That the *Miscanthus* is an invader seems evident from the lack of blackened stumps and the smallness of the clumps. The Pandanus trunks are somewhat charred.

Alluvial flat, inland from this; dark brown soil with abundant small manganese nodules on the surface. Burned not too long ago. Curious mixture of *Dimeria chloridiformis* and *Rhynchospora corymbosa*, about equal, conspicuously tufted, exposing about 20% bare soil.

- a *Dimeria chloridiformis*
- a *Rhynchospora corymbosa*
- a *Chrysopogon aciculatus*
- la *Hypoxis capitata*
- la *Fimbristylis annua*
- c *Waltheria indica*
- c *Rhynchospora rubra*
- lc *Casuarina equisetifolia*
- lc *Stachytarpheta indica*
- lc *Phyllanthus virgatus*
- o *Miscanthus floridulus*
- o *Heteropogon contortus*
- o *Phyllanthus saffordii*
- o *Hypoxis suaveolens*
- o *Fimbristylis*
- ~ *Ipomoea littoralis*
- ~ *Euphorbia*
- ~ *Vernonia cinerea*
- ~ *Cheilanthes tenuifolia*

Black lava(?) knob - old as lava, much eroded and weathered, recently burned over.

- a *Heteropogon contortus*
- la *Stachytarpheta indica*
- c *Pandanus tectorius*
- c *Waltheria indica*
- c *Dianella*
- c *Eugenia bryanii*
- c *Scaevola frutescens*
- c *Phyllanthus saffordii*
- c *Fimbristylis cymosa*
- c *Elephantopus mollis*
- c *Miscanthus floridulus*
- lc *Glossogyne tenuifolia*
- lc *Hypoxis capitata*
- o *Hypoxis suaveolens*
- o *Andropogon fragilis*
- o *Dimeria chloridiformis*
- o *Fimbristylis*
- o *Wikstroemia*
- o *Cassytha filiformis*
- o *Dodonaea viscosa*
- o *Triphasia trifolia*
- o *Scleria (small)*
- o *Fimbristylis annua*
- l *Rindeaya ensiformis*
- l *Crinia javanica*
- l *Centella asiatica*
- ~ *Casuarina equisetifolia*
- ~ *Glochidion marianum*
- ~ *Cerbera dilatata*
- ~ *Euphorbia*

1974 Guam

- ~ *Decaspermum frutescens*
- ~ *Tacca leontopetaloides*
- ~ *Paspalum abiculare*
- ~ *Matricaria hirtum*
- ~ *Ternstroemia*

J. S. Guinote, commissions
of Umatas, gave me the
following information

Stimulia chloridiformis =
Chaguan monoc
(eaten by cattle)

Lycopodium carmum =
Painea julitai
tr. = *Lycopodium* comb.

Fragaria torresiana =
fairly rare (one specimen
shown here)

Tacca leontopetaloides =
galagab (grated
and ~~the~~ starch washed
out, used for braiding)

Jan. 13 - Road between
Merizo and Inarajan
35447 *Ipomoea*
weedy roadside thicket

Jan.

climbing over bushes,
flowers dull pink-purple.

Jan. 13 - Martinez' Pasture
Dan Dan.

Vast flattish basin, draining eventually into Talofofo drainage system. Surrounded by flat-topped red erosion remnants.

Much, if not all, of this red material is bedded depositional or secondary, such as is usually seen in smaller lens-shaped exposures. There are also a few thin limestone remnants, said to be argillaceous Murians.

In the pasture are 3 predominant grasses, at least in the northern edge - *Chrysopogon*, *Dimeria*, and *Miscanthus*. The latter is more localized. In the bottom of the basin is a strip of reeds (*Phragmites*).

On the red rims, at least, the pasture seems to be overgrazed, favoring the *Chrysopogon*. The *Miscanthus* is eaten down to rounded tussocks of stiff stems.

Jan. 15 - Mataguac Spring, N. of Mt. Santa Rosa

An abundantly flowing spring coming out of a low hill of volcanic material at its contact with the Barrigada limestone. This contact is marked by a ravine and flat terrace of alluvium.

The most conspicuous vegetation is thickets of *Bambusa*, scattered abundantly in the ravine. On the steep sides around the spring great plants of *Angiopteris erecta* are ~~very~~ common.

along with other ferns, such as *Nephrolepis hirsutula*, *Tectaria crenata*, *Dryopteris indivisa*?, and *Pavalia solida*. *Artocarpus*, *Pandanus dubius*, *P. tectarius*, *Elaeocarpus joga*, *Hibiscus tiliaceus* and *Morinda citrifolia* make up ~~the~~ broad leaved thickets in addition to the bamboos. *Carica* and *Ipomoea* are common. Mosquitoes unbelievably vicious.

Jan. 16 - Forest around Pago Bay is nearly all *Leucaena glauca*. This extends abundantly to Ylig Bay. This has a small reed marsh at the mouth of the river. Forest along river is coconuts. Bluff to south of Ylig is *Miscanthus*, with forest below.

Jan. 16 - south bank of Talofobo River, about 200 m. above mouth.

Mud flats at water's edge, recently flooded.

35448

Heliotropium indicum L.

3

abundant on flat in hog pasture

3

49

Malvatum coromandelianum on large limestone boulder fallen from cliff, on flat

3

50

Hedyotis biflora

occasional on mud flat

1

51

Mollugo

rare on mud flat

1

52

Torenia

rare on mud flat

1

53

Torenia

rare on mud flat

3

54

Ceratopteris gaudichaudii

on mud at edge of water

0 m

erect, most plants larger, flowers lavender.

flowers dull orange yellow

flowers white.

prostrate

ascending

prostrate, rooting at nodes; flowers violet.

leaves spreading, apparently producing plantlets; this seems to be a terrestrial phase for living through floods. No floating ones seen.

Jan. 14 - West of Mapao,
3 miles w, n, w. of Talofofo Bay

occurrence (Ravine forest in upper
part of shallow broad
ravine -

Low bushy woods
with uneven canopy,
tangled undergrowth,
this mainly *Tripharis*
with scattered ~~coconut~~ trees.

Composition

- a *Pandanus tectorius*
- a *Hibiscus tiliaceus*
- a *Tripharis trifolia*
- a *Clerodendrum inerme*
- c *Glochidion nanianum*
- c *Freycinetia torresiana*
- c *Discozalysa*
- bc *Pandanus dubius*
- o *Cycas circinalis*
- o *Cassytha filiformis*
- o *Pithecellobium dulce*
- o *Flagellaria indica*

35455

Dryopteris

common on floor of forest

3 56

Scleria

common in edges of forest

100 m.

- o *Calophyllum inophyllum*
- o *Areca cathartica*
- c *Dryopteris*
- o *Cananga odorata*
- r *Caesalpinia major*
- r *Polypodium scolopendria*

rhizome prostrate, slightly
buried.

same - swamp forest on flat valley floor, with ponds of water and much mud.

The forest is largely a varying mixture of *Pandanus tectorius* and *Hibiscus tiliaceus*, alternating with small patches and strips of *Phragmites karha*. *Arecathura* is occasional. *Clerodendron inerme* is locally abundant, as is *Aerostichum aureum*.

patches of a large *Rhynchospora*. *Freyanetia* climbing in trees, occasional.

35457

Rhynchospora

dense patch in mud in broken swamp forest.

same - small eminence at edge of swamp

35458

mainly a thicket or scrub of *Tuprasia*, with some vines and a few large trees, mainly # 35453

35459

Distichlis common on low hill

35460

epiphytic

scattered coronas in some places abundant. *Cananga* very common around edges.

35461

erect leaves weakly sharp-edged.

50 m

tree 15 m. tall, 6 dm thick; sterile.

leaves terete, plant on stilt roots; one bud only seen.

35460

reclad

1

epiphytic

1 61

~~Pandanus~~

epiphytic

same - slope forest just
above swamp level.
Thick low tangled
forest.

- a. Hibiscus tiliaceus
- c Cananga odorata
- c Cestrum diurnum
- c, la Triphasia trifolia
- c ? 35458
- o Morinda citrifolia
- o Artocarpus altilis
- o Cycas circinalis
- o Aglaia mariannensis
- o Pandanus tectorius
- o Pandanus dubius

same - on rough limestone
outcrop - Maamong formation.
Thick forest on rough,
deeply pitted, broken
karstified surface -
aspect rather dry, few
epiphytes or terrestrial
ferns; much bare
rock under trees.

- c Pandanus tectorius
- c Pandanus dubius
- c Annona reticulata
- c Triphasia trifolia

50-60 m

somewhat
caespitose; buds white.

- c Cordia subcordata
- c Aglaia mariannensis
- c Guettarda speciosa
- c Bleckeria mariannensis
- c Guamia mariannensis
- c Freycinetia torresiana
- c Phyllanthus mariannensis
- c Flagellaria indica
- lc Cassytha filiformis
- o Intsia bijuga
- o Ponteria
- o Eugenia seawardiana
- o Psychotria mariana
- o Pycnosia lanceolata
- o Piper guahamense
- o Allophyllus sp.
- o Cycas circinalis
- o Polypodium punctatum
- o Ipomoea indica
- o Scaevola frutescens (edge)
- ~ Morinda citrifolia
- ~ Morinda umbellata
- ~ Maytenus thompsonii
- ~ Claoxylon
- ~ Melanolepis multiglandulosa
- ~ Artocarpus altilis (dug dug)
- ~ Macaranga
- ~ Nephrolepis hirsutula
- ~ Calaca papaya
- ~ Premna obtusifolia

~ fernarium simplicifolium

Jan. 17 - Tarague Beach
 sand flat below cliffs
 35462 *Wedelia biflora*
 common in coconut grove

Where flat below is
 wide the cliff is really
 a slope, covered by good
 forest, apparently in
 good condition.

The flat largely covered
 by coconut plantation,
 this quite choked by
 coconut seedlings.

On the beach *Pemphis*,
Messerschmidia, *Scaevola*
 and *Lepturus* are very
 conspicuous.

~~On cliffs~~

Jan. 17 - Flat top of
 plateau between Anderson
 Field and Tarague Beach.

Here the forest is in
 extremely poor shape.
 There is a scrubby layer
 which is continuous,
 2-5 m. tall. Above this
 are rather closely
 scattered trees, full
 forest size, of various
 kinds. These are
 all either dead or

1-2 m.

spawling herb,
 1-2 m. long; flowers yellow.

On cliffs which
 are very steep or vertical
Pemphis and *Bikshia*
 are dominant, with
 some *Scaevola* and
Pandanus.

in very bad shape,
 with upper branches
 dead and branches
 of sprouts along the
 trunk and main limbs.

I would judge that
 this is result of the
 forest being largely
 cleared, all except
 these large trees, which
 then suffered from
 exposure, most kinds
 of dense forest trees being
 unable to stand it.

Jan. 17 Just north of
Campanaya Point
(Lasaquén Point)

Forest on steep slopes
a bluffs. Medium
height forest with
uneven canopy and
thick undergrowth.

Composition (woody plants only)

- c *Ficus prolixa*
- c ~~Ch~~ *Ochrocarpos odoratus*
- c *Ochrosia oppositifolia*
- c *Macaranga*
- c *Guamnia mariannensis*
- c *Morinda citrifolia*
- c *Cestrum drummum* (edges)
- o *Aglaia mariannensis*
- o *Psychotria mariana*
- o *Pouteria*
- o *Cynometra ramiflora*
- o *Pisonia grandis*
- o *Pipturus argenteus*
- o *Premna obtusifolia*
- o *Hibiscus tiliaceus*
- o *Phyllanthus marianus*
- o *Melanolepis multiglandulosa*
- o *Eugenia unguiculata*
- o *Triphasia trifolia*
- o *Cyrtosperma*
- o *Guettarda speciosa*
- o *Portia bijuga*

sloping terrace at foot
of cliffs, from 60 m.
down to 10 m. or less.

Mostly covered by a
forest similar to that
on slope but with
Pisonia grandis one of
the most common
trees, *Barringtonia asiatica*
also common. This
is rather open beneath
where well developed,
except for a few *Triphasia*
bushes.

The seaward edge
of this terrace is
not forested. It is a
rough, pitted, "karenfeld"
surface, ~~to~~ the edge
at 8-10 m. above sea level.
Below is an excellent
development of the
so-called "warm-algal"
terrace, at about high
tide level, irregularly
developed, from absent
up to many m. wide,
very flat topped, washed
by waves.

The edge of the terrace
has a vegetation of
dwarfed *Pemphis* plastered
to the rock, crawling
over the pits, and of

Fimbristylis obtusifolia in shallow pits. Back a little the *Pemphis* becomes more luxuriant and there is some admixture of *Heliotropium anomalum*. There is also a little *Phyllanthus* sp., possibly dwarfed *P. marianus*, dwarfed *Callicarpa condensis*, prostrate clumps of *Ischaemum*? sp., *Hedyotis albida-punctata*, and *Capparis cordifolia*.

The vegetation, esp. the *Pemphis*, becomes more luxuriant until 10-15 m. back there is a zone of *Wedelia biflora* var. *canescens*.

Jan. 17 - just north of Campanaya (Lassaguan) Point. in low vegetation on deeply pitted limestone near edge of terrace above sea.

35463 *Canavalia* ~~severa~~ ^{rosea (Sw.) DC}
occasional at edge of scrub

64 *Phyllanthus marianus* M-A
in pitted limestone in very low vegetation

This is varied by patches of *Ipomoea pes-caprae* and of *Paspalum vaginatum*?, also a low patch or two of *Messerschmidia* with upper branches dead (from 1949 typhoon?)

Immediately back of this and starting abruptly is a dense scrub 2-4 m. tall, the upper branches dead (from typhoon?)

Messerschmidia argentea
Pandanus dubius
Pandanus tectorius
Hibiscus tiliaceus
Clerodendrum inerme
Ochroma oppositifolia
Achrocarpos odoratus
Ipomoea tuba
Vigna marina

The trunks of some of the *Messerschmidia* were as much as 3 dm. thick.

10 m

sterile vine climbing over low vegetation.

Prostrate shrub, leaves mostly vertically, round.

35465

Ischaemum?

2

occasional in low vegetation
a little back from edge
of cliff.

3

66

Hedyotis albido-punctata
common in pits in
limestone on terrace

3

67

Paspalum vaginatum
patches on limestone
back from edge of cliff

3

68

Portulaca sarcoensis
rare on pitted limestone

3

69

Achyranthes
common in low vegetation
back from edge of limestone cliff

1

70

Heliotropium anomalum
occasional in low
vegetation on pitted limestone

3

71

Fimbristylis obtusifolia
common on pitted
limestone at top of cliff

5

72

Lepturus repens
common on pitted limestone

5

73

Wedelia biflora var. *canescens*
abundant on terrace back
from edge of limestone cliff

Jan 17 - just north of
Campahaya (Tasaiguan) Point

5

74

Asplenium
on rocks at mouth of spring

5

75

Indigofera suffruticosa Mill.
common on roadside
on slope

20 m.

strongly depressed
clumps, blades flat,
no good spikes seen.

spreading; leaves
fleshy; flowers white;
fruit very fleshy before
drying.

sterile, mat-forming.

prostrate, tangled
patches; flowers yellow.
sprawling herb;
flowers bright magenta.

prostrate, leaves and
calyxes fleshy.
caespitose.

prostrate, mat-forming

prostrate, sprawling
herb, flowers yellow

20 m.

50 m.

shrub: 2 m. tall

Jan. 18 - one mi. s. of Taguea, 112 m.
on north plateau

patch of forest, mainly
Pandanus, on limestone soil

35476 *Capsicum frutescens*
very common in undergrowth

1 77 *Tarennia*

rare in undergrowth

5 78 *Piper guahamense* C.D.C.

common in undergrowth

7 79 *Dryopteris*

common in undergrowth

6 80 *Geniostoma micranthum* var. *halfordii* (G. & A.) Forst.

rare in ~~the~~ second
story of forest

4 81 *Dendrobium*

epiphytic on ~~the~~ Pandanus ~~trunk~~

5 82 "

epiphytic on Pandanus trunk

1 83

epiphytic on Pandanus trunk

1 84

epiphytic on Pandanus trunk

1 85

Taeniophyllum

epiphytic on Pandanus trunk

This forest is 10-15 m.
tall, canopy broken and

herb about 1 m. tall,
flowers greenish white,
anthers bluish; ripe
fruit scarlet.

shrub 3 m. tall;

fruit immature

shrub 1.5 m. tall,

spikes erect; plant
with a nice odor when broken.

rhizome prostrate,

slightly buried;

fronds, fertile and

sterile similar, erect,

arching.

small tree 4-5 m. tall,

flowers white.

caespitose, stiff; flowers

yellow.

caespitose; flowers dull

reddish.

roots flat, greenish,

flower yellow.

rather incomplete, ground
covered almost completely

by tall *Nephrolepis*
hirsutula and *Dryopteris*.
Forest is largely Pandanus
with no *Artocarpus* or
Ficus prolixa. Only a
small patch investigated.

- woody*
a *Pandanus tectorius*
c *Morinda citrifolia*
c *Premna obtusifolia*
c *Flagellaria indica*
c *Capsicum*
lc *Piper guahamense*
o *Ochrosia oppositifolia*
o *Cestrum diurnum*
o *Triphasia trifolia*
o *Guamia marianensis*
o *Aglaia marianensis*
o *Melanolepis multiglandula*
o *Carica papaya*
~ *Maytenus*
~ *Taranea*
~ *Discocalyx*
~ *Claoxylon*
herbs
a *Nephrolepis hirsutula*
la *Dryopteris*
c *Davallia solida*
c *Ipomoea indica*
c *Belvisia ~~lancea~~ spirata*
c *Vittaria elongata*
o *Pyrrosia lanceolata*
o *Polypodium punctatum*
o *Nephrolepis acutifolia*
o 5 species of *relids*.

Jan. 18 - 1-1.5 km. s.e. of
Agabo guamar, center of
north plateau.
Thick forest, appearing
rather secondary,
dominated by ~~Pandanus~~
~~with ~~some~~ Artocarpus~~,
trees mostly under 3 dm.
dbh, a few much larger.
Undergrowth rather
thick, locally, in
thinner places in forest,
of *Nephrolepis hirsutula*.

- woody*
a *Artocarpus altilis* (dugdag)
c *Ochrosia oppositifolia*
c *Premna obtusifolia*
c *Hibiscus tiliaceus*
c *Aglaia marianensis*
c *Maytenus*
c *Elaeocarpus foga*
c *Discocalyx*
c *Triphasia trifolia*
c *Guamia marianensis*
c *Piper guahamense*
c *Pandanus tectorius*
c *Flagellaria indica*
o *Eugenia reinwardtiana*
o *Claoxylon*
o *Ficus tinctoria*
o *Carica papaya*
o *Macaranga thompsonii*

herbs
la *Nephrolepis hirsutula*
(terrestrial)

1954 Guam

(epiphytic)
Vittaria elongata
Davallia solida
Polygodium punctatum
~~Mega~~ *Dischidia puberula*
Asplenium nidus
Asplenium lasiopitifulum
Asplenium sp.
Belvisia spicata
Polygodium scolopendria
Nephrolepis acutifolia

Jan. 12 1-1.5 km. s.e. of
 Agaña Gurnas,
 thick forest

- 35486 *Antrophyum reticulatum*
 2 epiphytic
 3 87 *Paspalum conjugatum* ?
 in clearing, in bare soil
 2 88 *Dischidia puberula*
 common festooning
 tree trunks
 6 89 *Crassocephalum crepidioides*
 common in clearing

Jan. 19 Asan
 roadside thicket on limestone

- 5 90 *Gliricidia sepium*
 local colony

175 m.

spreading clumps

leaves thick, sap milky;
 flowers scarce, yellowish.

flowers brick red.

3 m.

spreading tree 6 m. tall,
 branches bare except
 some at tips which
 have tuft of leaves;
 flower clusters along
 bare branches; flowers
 pink with yellow spot
 in middle of standard,
 calyx maroon.

Jan. 19 - south ridge of
Mt. Alifan

thick low forest

35491 *Alocasia*

2

common along lower
edge of forest above road

5

92 *Aglaia mariannensis*
common tree

15

93 *Ixora triantha*

common in low woods,
especially on west slopes,
on limestone

5

94 *Cordia thyrsiflora*

rare in low woods

7

95 *Artocarpus altilis* var. *mariannensis*

common tree in woods
on limestone

5

96 *Pteris*

common on bare limestone
along road.

~~35492 *Morinda fruticosa* var. *glaberrima*~~

occasional in low

Jan. 19 - north slopes of
Mt. Almagosa

~~in ravine forest~~

2

97 *Morinda umbellata* var. *glaberrima*

occasional in ravine forest.

4

98 *Fimbristylis*

bottom of old limestone
quarry

2

99 *Areca cathecu*

occasional in ravine forest

280 m.

stem decumbent with
distal part ascending;
petioles mottled
with purple; spathe
yellow, spadix cream
colored.

small tree (others fairly
large); flowers orange.

small slender tree
up to 5 m. tall. bracts
hale toward base.

ripe fruit reddish black.
shrub 2 m. tall, ripe
fruit red.

spreading tree 15 m. tall;
sap milky; sterile

Tree

260 m.

twining vine, climbing
in trees; buds white.

tree 5 m. tall, roots pinkish when
cut, immature fruit with red endosperm.

35499

5

Jan. 19 - 2 km. e. of Mt. Alifan
Scleria
 in ravine forest, abundant

Jan. 19 - hills just n.e. of
 Apra Heights
 partially revegetated
 erosion scars.

35500

3

Scleria
 on slopes, especially under
 Casuarina trees where
 needles cover ground.

r 01

rare in grassy spots

6

01

Stachytarpheta jamaicensis
 one small colony seen

5

03

Melastoma malabathrum
 common

Jan. 19 - slopes to east of
 Mt. Alifan, above Fena
 River Dam.

Ravine type forests
 alternating with slopes
 and ridges covered by
Miscanthus. Several
 sites examined. The
 forest varies locally
 in aspect and composition
 but is always low
 and dense, with
 undergrowth.

150 m.

loosely
~~culms~~ caespitose,
 culms ascending.

110 m.

Ravine just n. of Apra Hts. has
 weakly developed ravine type forest,
 mostly Casuarina some Pandanus

culms solitary or
 almost so.

erect

erect; flowers dark
 blue; leaves bright green.
 shrubs 1-2 m. Tall,
 dark green; flowers
 white, stamens yellowish
 with pink anthers.

One site, relatively low alt.

a *Bambusa vulgaris*

1a *Pandanus dubius*

c *Hibiscus tiliaceus*

c *Pandanus tectorius*

c *Areca cathecu*

c *Cycas circinalis*

c *Cananga odorata*

c *Freycinetia toresiana*

c *Tupharia trifolia*

c *Flagellaria indica*

s *Morinda citrifolia*

s *Timonius*

s *Cestrum diurnum*

another site, slightly higher alt.

Thick forest of an even height at about 6-8 m.

- a Pandanus dubius
- a Hibiscus tiliaceus
- c Dryopteris
- lc Arecia cathartica
- o Glochidion marianum
- o Medinilla rosea
- o Cyrtosperma circinalis
- o Triplaris trifolia
- o Freziera torresiana

Another site, near Mt. Alifan
Very ragged forest with small openings and dense tangled undergrowth.

- a Pandanus tectorius
- a Hibiscus tiliaceus
- a Licania (large)
- c Pandanus dubius
- c Glochidion marianum
- c Medinilla rosea
- c Freziera torresiana
- c Nephrolepis bisectata
- c Miscanthus floridulus
(in openings and some perhaps under sparse trees - doubtful if really invading ??)
- c Cyrtosperma circinalis
- r. Caribaea dilatata
- r. Arecia cathartica

- r. Elaeocarpus jaya
- r. Antocarpus altilis
(looks like seedling form)

~~for~~ sword-grass vegetation on slopes of lower argillaceous beds of Alifan limestone. Seem to be dip slope below low escarpment which is hard pink bed of same limestone. Grass is reasonably dense and 1.5 m. tall except where actual bare rock is exposed.

- a Miscanthus floridulus
- o Hyptis capitata
- o Ageratum conyzoides
- o Nephrolepis bisectata
- o Premna obtusifolia (seedling)
- c Dryopteris
- o Dianella
- r Wikstroemia elliptica
- r Cyrtosperma circinalis

Forest on pitted (karrenfeld) hard limestone above the sword grass

Dense low forest, in many places only penetrable by liberal use of machete. Much of density due to pure

patches of *Pandanus dubius*

- a *Pandanus dubius*
- c *Pandanus tectorius*
- c *Cycas circinalis*
- c *Triphasia trifolia*
- c *Freycinetia torresiana*
- o *Morinda citrifolia*
- o *Claoxylon marianum*
- o *Premna obtusifolia*
- o *Piper guahamense*
- o *Aglaia mariannensis*
- o *Phyllanthus marianensis*
- o *Davallia solida*
- o *Nephrolepis hirsutula*
- o *Ficus prolixa*

Another site on Alifan
limestone, near saddle
bet. Alifan and Almagosa Mts.
Dense tangled forest.

- a *Pandanus dubius*
- c, la *Pandanus tectorius*
- c *Macaranga thompsonii*
- c *Ficus prolixa*
- c *Pipturus argenteus*
- c *Triphasia trifolia*
- c *Cycas circinalis*
- o *Barringtonia asiatica*
- o *Artocarpus altilis* (climbing)
- o *Cestrum diurnum*
- o *Aglaia mariannensis*
- o *Melanolepis multiflora*
- o *Arecia cathecu*

Alifan, east slope bet.
quarry and saddle -
list of woody species seen
along road. (order not significant)

- Intsia bijuga*
- Hibiscus tiliaceus*
- Ochrosia oppositifolia*
- Bambusa vulgaris*
- Triphasia trifolia*
- Annona muricata*
- Premna obtusifolia*
- Artocarpus altilis*
- Melanolepis multiflora*
- Ficus prolixa*
- Scaevola frutescens*
- Macaranga thompsonii*
- Claoxylon marianum*
- Guamia mariannensis*
- Annona reticulata*
- Carica papaya*
- Pipturus argenteus*
- Elaeocarpus jays*
- Melochia hirsutissima*
- Pouteria*
- Cestrum diurnum*
- Muntingia calabura*
- Arecia cathecu*
- Allophyllus*
- Guetarda speciosa*
- Piper guahamense*
- Premna obtusifolia*
- Ficus tinctoria*
- Ilex triantha* (common on w. slope)
- Psychotria malaspinae*
(only seen on w. slope)

Jan. 20 - Turnon Beach

ground
rather
flat

This is rather sparse
coconut grove varying
to open - was completely
cleared except for the
coconuts in early 1946, acc.
Dr. Douglas Osborn.

Now there is an almost
continuous understory
~~forest~~ with a canopy
about 4-6 m. high, the
tree trunks up to 6 cm.
diam. except for Carica
which get much larger.

In general the vegetation
is a weed community.

- a Muntingia calabura
- a Cestrum diurnum
- a Leucaena glauca
- a Stachytarpheta indica
- a Paspalum conjugatum
- a Oplismenus compositus
- la Pennisetum polystachyum
- la Blechnum brownii
- c Elephantopus spicatus
- c Ipomoea indica
- c Lida rhombifolia
- c Lida acuta
- lc Triumfetta semitriloba
- o Pithecellobium dulce
(ind. a few large ones, obviously
not cleared in 1946)
- o Eragrostis amabilis
- o Morinda citrifolia
- o Canavalia maritima

- o Passiflora foetida
- o Cereus echinatus
- o Clerodendrum inamo
- o Polypodium scolopendria
- la o Kalanchoe pinnata
- la o Triphasia trifolia
- o Phyllanthus marianensis
- l Sporobolus elongatus
- l Centella asiatica
- l Ipomoea pes-caprae
(just near beach)
- la Scaevola frutescens
(just near beach)
- r Antocarpus altilis
- r Cassytha filiformis
- r Ximenia americana

One patch of Leucaena
has tops dead. The twigs,
to about 15 mm diam. have
their bark removed.
Boring suggests that
Acartia is responsible.

Following observed in dense
shade: a Leucaena (seedlings)
a Oplismenus compositus
o Lida acuta
o Kalanchoe pinnata
o Polypodium scolopendria
c Corchorus multiflorus (seedlings)
r Carica papaya
(seedlings)

Jan. 21 - 1 km. n.w. of Agaña,
north plateau

35504 *Maytenus*

4

occasional in understory
of forest

Jan. 21 - about 1 km. e. of
Agaña, north plateau.

05 *Conyza canadensis* (L.) Cronq.

abundant along roadside
on crushed coral limestone

06 *Bidens pilosa* var. *radiata*

occasional along roadside
on crushed coral limestone.

07 *Caesalpinia major* (Pitheci) Exell, Standley
common in secondary
thickets.

Jan. 22 - Naval Air Station,
Agaña, nursery

08 *Malvaviscus*
cultivated

09 *Acacia confusa* Merr.
cultivated

10
apparently planted

11 *Hedyotis*
weed

12 *Acalypha*
cultivated

155 m.

semi-scandent shrub
3 m. tall.

165 m.

pusilla (Nutt.) Cronq.
erect

erect, rays white.

heavy tangled vine;
leaves glossy.

85 m.

shrub 2 m. tall, flowers
scarlet.

diffusely branched
tree 5 m. tall; flowers yellow.
prostrate, sterile.

erect, flowers white.

shrub, leaves edged
with white.

Jan. 22 - Anao, e. n. e. of
Mt. Santa Rosa

- 35513 *Euphorbia tinianensis* Hook.
low terrace of deeply
pitted limestone
- 4 14 *Blechnum marianensis*
occasional on steep
cliff of limestone.
- 3 15 *Ficus prolixa*
occasional on cliff of
rough limestone.
- 6 16 *Peperomia*
common on rough limestone
cliff
- 1 17 *Balanophora*
rare on rough limestone
cliff, *Triphasia* common
but not certain that it is
the host.
- 5 18 *Ficus prolixa*
common at top of
limestone cliff

~~Jan. 22.~~ Jan. 22. - plateau
n. e. of Mt. Santa Rosa,
n. e. of Anao

19 ~~*Pseudomorus brunoniana*~~
~~occasional in woods~~

20 thick forest on rough limestone

- 5 19 *Pseudomorus brunoniana*
occasional
- 1 20 *Eugenia javanica*
rare

- to 5 m. stems prostrate; flowers
pale bronze-green.
- 100 m. shrub 4 m. tall, sap
milky, fruit immature.
- 100 m. small tree with
abundant aerial roots;
figs immature (pedicels
variable in length).
- 140 m. fleshy, leaves pale
green beneath, darker
green above. "pot puput" medicinal.
- 140 m. body yellowish,
inflorescence and
bracts dull rose pink.
- 160 m. tree 6 m. tall spreading,
with many aerial
roots. "nunun"

160 m.

shrub 2.5 m. tall, ripe
fruit and mature
catkins purplish.
sapling, sterile.
"makupa" fruit eaten.

35521

Dischidia

1

epiphytic on tree trunk

3

22 *Allophylus*

rare

4

23 *Guamia marianensis*

common

6

24 *Randia cochinchinensis*

rare

7

25 *Alyxia*

occasional

2

26 *Rapanea latifolia*

occasional

3

27 *Ipomoea triantha*

rare

21

29 *Grewia*

rare

3

28 *Eugenia*

rare

4

30 *Mucuna gigantea*

rare

16070

sterile vine, clinging
to trunk by roots; ~~fleshy~~
leaves fleshy. "pat puput"
tree 10 m. tall, 12 cm.
thick, sterile.

small tree 8 m. tall;
leaves dark green,
subglossy, ripe fruit
red, fleshy. "paipai"
wood used for pins
handles and rafters
small tree 6-8 m. tall,
fruit immature. "sumai".
tangled vine climbing
tree trunks, sap milky;
fruit immature
"lederan"

sterile small tree
"katuk palawan" bark
said to ~~irritate~~ ^{irritate} skin
when dry.

slender small tree 5
m. tall, sterile "gaquahot"
tree 12 m. tall, 20 cm. thick;
fruit immature, flowers
whitish. "angilo" wood very
flexible, used for houses.

shrub, sterile. "agatalang".
vine tangled in trees;
flowers green

Jan. 22 Yigo

- 35531 *Ipomoea indica* (Burm.) Merr.
one colony seen in
roadside thicket

- 5 32 *Vitex*
planted along road
2 33 *Aleurites moluccana*
planted, rare
6 34 *Aleurites moluccana*
planted, rare

Jan. 23 Talofofs Village

- 2 35 *Thunbergia*
cultivated

Jan 23 - 1.5 km. w.m.w. of
Talofofs Village

- 1 36 *Miscanthus floridulus*
open savanna with
tall dense grass, on
deeply weathered volcanic rock.

Jan 23 - Maagas River,
Talofofs System, 1.5 km
w. of Talofofs Village

- 2 37 *Hernandia lilyquistii*?
on low silty natural
levee, uncommon

179 m.

twines, flowers white
"bafga"

- trees 12 m. tall, ripe
fruit black.
- small tree 5 m. tall,
flowers white.
- tree 10 m. tall, fruit
immature; ripe ones
picked up from ground
beneath.

70 m.

wine climbing over
house, flowers white,
in pendant racemes.

100 m.

clump 2 m. tall.
(sample taken for
analysis for silica)

15 m.

sterile tree 6 m. tall,
spreading "nonst"

Jan. 23 - Fanagchan Tr. 0.

Thick low forest on brown soil.

35538
3*Discocalyx*

common in sparse undergrowth

2

39

*Balanophora megaphylla*common, parasitic on roots of *Triphasia*.

1

40

Balanophora megaphylla

same

This forest is scrubby, 3-5 m. tall, with a few coconut trees and occasional other trees extending above the rather complete canopy. The canopy is mostly *Triphasia*, the trees 3-6 cm. diam. Curiously no ferns. Ground is a dark brown soil, pH 6, loose at surface, in shot-like pellets with of earthworms?

Composition:

- a *Triphasia*
- c *Cocos nucifera*
- c *Hibiscus tiliaceus*
- c *Premna obtusifolia*
- c *Morinda citrifolia*
- c *Pandanus tectorius*
- c *Areca cathecu*
- c *Glochidion marianum*

65 m

shrub 1 m. tall, sparsely branched; fruit red, edible, pleasantly acid when ripe.

♀

plant body tan; inflorescence and bracts pink.

♂

same

- c *Flagellaria indica*
- c *Discocalyx*
- c *Balanophora* (balebale)
- lc *Pandanus dubius*
- c *Cycas circinalis*
- ~ *Jacquinum scopulifolium*
- ~ *Piper guahamense*

This forest is in places readily penetrable. In other places the *Triphasia* is tangled and must be cut, which is not easy.

The absence of ferns and most herbs is conspicuous.

see p. 135 - forest.

Jan. 24 - Campanaya
Point

35541

3

~~35541~~
~~3~~
~~common in thick~~
~~forest on limestone terrace~~
Pisonia grandis R.Br.
common in thick
forest on limestone terrace

2 42

Plurynia ruderalis
dissected and pitted
limestone terrace
just above ~~sea~~
sea.

The general forest here is very uneven and tangled - mostly *Hibiscus tiliaceus*, *Pandanus tectorius*, *Pisonia* and *Cestrum*. The under-story is dense, 3-5 m. tall. A scattered upper story of *Pisonia*, *Ochrosia* and *Pandanus*, 10-15 m. tall.

The general soil here is thin and red, lying on an irregular limestone substratum.

Composition here is:

- a *Hibiscus tiliaceus*
- a *Triphasia trifolia*
- a *Cestrum diurnum*
- c *Pisonia grandis*
- c *Pandanus tectorius*
- c *Cycas circinalis*
- c *Ochrosia oppositifolia*
- c *Morinda citrifolia*

20 m.

tree 15 m. tall, 6 dm.
thick (others larger);
leaves badly eaten
by insects; sterile.
stems red, fleshy;
flowers dull reddish.

- c *Guamnia marianensis*
- c *Aglaia marianensis*
- c *Premna obtusifolia*
- o *Psychotria mariana*
Openings weedy or with
mats of *Lepturus repens*.
Large clumps of *Pisonia*
trees, quite tall, have an under-
growth of *Guamnia marianensis*
- a *Triphasia trifolia*
- a *Cycas circinalis*
- c *Pandanus tectorius*
- c *Aglaia marianensis*
- c *Ochrosia oppositifolia*
- c *Morinda citrifolia*

There is very little humus
here. The red soil is very thick, up
to 3 dm. or more, very light, loose,
and crumbly & powdery, obviously
much worked by earthworms
(machete goes down with no
resistance, at least when dry)

seems obvious that the presence of the other leaves
in the *Guamnia* makes the reaction sufficiently
basic to permit complete decomposition, perhaps
also permits earthworms to exist in abundance.

Jan. 24 - Tammuning
 35543 *Andropogon* ^{Bambusa/multiplex}
 2 (Lam.) Razouk.
 cultivated as ornamental

Jan. 25 - Yona
 4 44 *Cajanus cajan*
 abundant locally along
 roadside

Jan. 24 - Dan Dan
 (Martinez Pasture)
 on small limestone
 outcrops ~~is~~ slightly
 elevated above surrounding
 weathered volcanic soil.

2 45 *Glossogyne tenuifolia*
 common in limestone
 crevices

1 46 *Curatiga orchinoides*
 common

1 47 *Helaginella*
 very local on vertical
 surface of fine ~~less~~ grained
 chalky limestone.

4 48 *Allophylus*
 very local

4 49 *Callicarpa candicans*
 local

3 50 *Emilia sonchifolia*
 common

1 51 *Phyllanthus saffordii*
 occasional

15 m.
 det.
 McChase

canes slender, about
 1 cm. thick, growing in
 a close clump, 2.5 m. tall.

7 m.

erect herb 1.5 m. tall,
 flowers yellow, standard
 lined with deep red
 outside.

110 m.

flowers yellow.

flowers yellow, plants
 mostly sterile at this
 time.

low shrub, 0.5 m. tall,
 much branched, flowers
 white; fruit yellow.
 low shrub 0.5 m. tall;

flowers lavender, little
 exceeding involucre.

35552

4

- common locally
 1 53 *Cantharosperrum* (scarabaeoides)
 rare
 1 54 *Oxalis corniculata*
 occasional, rooted deep
 in crevices
 2 55 *Hedyotis biflora*
 occasional

same - volcanic
 soil.

- 1 56 *Euphorbia*
 rare
 5 57 *Jussiaea limifolia*
 small colony in moist
 sink in volcanic soil
 7 58 *Andropogon fragilis*
 common in flat-topped
 erosion remnants of red soil

Here is a large basin of
 volcanic soil, gently
 sloping to a red-lined
 stream which drains
 into Marajan valley or
 the one just north of it.

Around the edges in
 all directions are very
 conspicuous erosion
 scars, mostly rather
 bright red.

On the east side ~~is~~
 is a complex of exposures

flowers lavender.

flowers yellowish.

flowers yellow.

prostrate; flowers white.

flowers white.

flowers yellow.

of several kinds of
 limestone, including
 at least two thin, rather
 small and somewhat
 dissected flat platforms
 of the argillaceous member
 of the Mariana formation.
 This overlies at least two
 distinguishable beds of
 older limestones.

Around the argillaceous
 limestone the soil is of a
 yellow-brown color, elsewhere
 it is red.

Composition of vegetation on
argillaceous limestone:

Miscanthus floridulus
Phyllanthus simplex
Hyptis suaveolens
Phyllanthus saffordii
Chrysopogon aciculatus
Oxalis corniculatus
Callicarpa candicans
Glossogyne tenuifolia
Elephantopus mollis
Asclepias curassavica
Hedyotis biflora
Lysedrella nodiflora
Euphorbia hirta
Mitracarpum hirtum
Cassia sp.
Lida acuta
Psidium guajava
Centella asiatica
Waltheria indica
Hyptis capitata
Cantharospherum scarabaeoides
Curculigo orchivoides.

On other limestone:

Miscanthus floridulus
Phyllanthus saffordii
Hyptis suaveolens
Glossogyne tenuifolia
Fimbristylis obtusifolia
Phyllanthus simplex
Sporobolus elongatus
Lida acuta
Stachytarpheta indica

Psidium guajava

Composition of vegetation
on volcanic soil immediately
around limestone:

Miscanthus floridulus
Chrysopogon aciculatus
Dimeria chloridiformis
Centella asiatica
Hyptis suaveolens
Hyptis capitata
Waltheria indica
Phyllanthus saffordii
Stachytarpheta indica
Vernonia cinerea
Mitracarpum hirtum

All of these types are
grassland. Such shrubs
as are there are much
dwarfed.

It would appear that the
small size of the area
might account for
so many of the species
from the surrounding
savanna being on these
limestone patches.

There seems to be considerable
evidence of slumping
here, even on the more
gentle slopes. Though it
is hard to distinguish from
lateral erosion.

Jan. 26 - near Laguas,
n. of base of Orote Peninsula
marsh with standing
water.

- 35559 *Cyperus polystachyos* Rottb.
4 dominant over much of
marsh.
- 3 60 *Cyperus polystachyos* Rottb.
occasional in edges
of marsh, in soft mud
- 3 61 *Chara zeylanica*
abundant in open
water
- 4 62 *Bacopa monniera*
abundant in open
part of marsh or mud
- 4 63 *Rhynchospora*
common in open ^{water} part
of marsh
- 3 64 *Paspalum*
common in open part
of marsh.
- 3 65 *Cassia*
occasional in mangroves
at edge of marsh

Large pond a mud-flat,
mostly covered by standing
water, but this very
shallow. In the water is
a mat of *Chara*, and
in it the *Cyperus* forms
a sparse layer of tufts
3-5 cm. tall. The landward

Jan. 26.

small tufts

small tufts

bright green, odor
especially foetid.

forming luxuriant
soft mat; flowers
very pale lavender.
culms erect, forming
hummocks.

Caespitose, forming
dense hummocks;
leaves somewhat glaucous.
vine clambering
in trees.

edge is in places not
submerged, even to
some width. Here the
wet mud is covered by
mats of *Paspalum*
vaginatum and
of *Bacopa monniera*.

Jan. 26 - Aguada River

Mangrove swamp,
partly filled with
crushed coral road fill

- 35566 *Cyperus difformis*
rare on ~~the~~ bare ground
- 5 67 *Eragrostis ciliaris*
occasional on bare ground
- 2 68 *Elescharis*
rare on bare ground
- 1 69 *Cyperus polytrichus* Rottb.
rare on bare ground
- 3 70 *Glochidion*
occasional at edge
of mangrove in bushy
thicket.
- 4 71 *Sumnitzera coccinea*
rare in mangrove swamp
- 4 72 *Rhizophora apiculata* Bl.
dominant in mangrove swamp
- 3 73 *Elescharis*
rare in grassy wet
area at edge of mangrove
swamp.
- 5 74 *Avicennia*
common in sparse
mangroves on firm
calcareous silt.
- 5 75 *Canavallis*
~~common on open ground~~
~~flat~~

2 m.

spreading tufts

small tree

small tree, 4 m tall.

flowers scarlet.

tree 6 m. tall, more or
less spire-shaped, with
arching aerial roots.
stems compressed.trees up to 5 m. tall,
mostly sterile (one flower
seen, this 4 parted, yellow).
seedlings abundant.
Inermatophores slender, erect.
~~prostrate, elongate,~~
~~leaves erect; flowers~~
~~rose pink.~~

Jan. 26 - ^{just} south of bay
of Orote Peninsula
open marshes partly
filled in by wave-
deposited gravel.

35575 *Canavalia rosea* (Sw.) DC.
common in open ground

5 76 *Panicum purpurascens*
dominant in patches
in marsh

47 77 *Scirpus*
dominant in large
areas in marshes

5 78 *Paspalum vaginatum*
dominant in large
flats in edges of marshes

79 *Avicennia*
common in edges of
marsh.

Here are open water ponds
cut off from the sea by broad
sand and gravel ridges.
these apparently widened
by the washing inward of
much of the loose material
of the ridges and deposit
of this around the bases
of the *Leucaena* plants
on the inner slopes of
the ridges and into the
edges of the ponds.

The *Leucaena* is dead, at
least above. Some plants are

prostrate, elongate;
leaves erect; flowers
rose-pink.
forming dense deep
mat.

dense growth,
from rhizomes

forming dense deep
mat.

trees 3-6 m. tall;
foliage pale green;
all trees seem sterile.

sprouting from the base.
The sparse thickets
on these beach ridges
are largely *Casuarina*
along the inner margin,
with *Leucaena* outward,
some *Sibiscus tiliaceus*
and *Thespesia* mixed in.
In open places on the
sand and gravel is
some *Sporobolus per-capras*
and *Canavalia*.

The ponds are surrounded by flats of matted *Paspalum vaginatum* with large patches of *Panicum purpurascens* and *Scirpus*, as well as occasional clumps of *Cyperus odoratus* and *Cyperus javanicus* and scattered small trees of *Avicennia*. ~~These areas are completely sterile, but they have roots and flowers.~~

Jan. 24 - near Aguada River Mangrove Swamp with *Rhizophora* and *Avicennia* from very sparse to quite dense, growing on fine lime-silt, firm enough to walk on at low tide. *Lumnitzera* is rare and very local. Some *Acrostichum* present, especially on landward side of road. A large area of this is dead or almost so, probably from oil on the water drifting in from Apra Harbor. The trees are still standing.

Where the *Leucaena* is thickest the *Miscanthus* is fairly and the clumps sparse. The only one of the commonly associated species in *Glochidion marianum*. This grows even at the edge of the mangrove. It is common in the secondary thickets as well as in the sword-grass.

A fill of crushed coral has as pioneer species:

Chloris inflata
Dactyloctenium aegyptium
Sida rhombifolia
Tridax procumbens
Corchorus acutifolius
Ipomoea pes-caprae
Heliotropium ovalifolium
Cyperus odoratus
Leucaena glauca
Cyperus difformis
Phyllanthus niruri
Scaevola frutescens
Eragrostis ciliaris
Eleocharis
Conchium echinatum
Malachra
Pennisetum polystachyum
Euphorbia hirta
Stachytarpheta indica
Eclipta alba
Vernonia cinerea
Eleusine indica
Cyperus iris?
Fimbristylis cynosu
Lepturus repens

Beside this is a patch of *Miscanthus floridulus* on a small hump of argillaceous limestone. This seems to be being crowded out by *Leucaena* - there are large bushes scattered in and many young plants.

35580

Jan. 26 - Orote Peninsula,
central upland
Saccharum spontaneum
common locally
in open dry limestone.

81

Jan. 27 - Agaña
Chrysophyllum cainito
cultivated

Jan 27 - Fonte (Com Marianas)
Hill, n. of upper Fonte River
nursery

82

Tabebuia pentaphylla
cultivated

83

Cassia fistula
cultivated

84

Ixora coccinea
cultivated

85

grass
common weed

86

Tecoma stans
cultivated

87

Tithonia diversifolia
established around
nursery.

88

Pimenta
cultivated

same - in brushy thicket

89

Jatropha curcas L.

90

Citrus

20 m.

culms erect, in
clumps, 2-2.5 tall.

2 m.

sterile spreading tree
5 m. tall.

150 m.

small tree 7 m. tall;
flowers purplish pink.
small spreading
tree, fruits pendent.
shrub 1 m. tall
flowers vermillion,
fruits dark red
culms depressed to
ascending, rooting at nodes.

diffuse

shrub 1 m. tall,
flowers bright yellow.
sprawling large
herb, flowers yellow.

very erect ^{small} tree, aromatic
when broken.

100 m.

shrub 3 m. tall, flowers
pale green, fruit immature.
small dark green tree, fruits
greenish yellow, aromatic, very sour.

Jan. 27 - Mangumaw

abandoned nursery site

35591 *Coccolobis uvifera*92 *Cordia sebastena*
in shade93 *Cinnamomum camphora*94 *Solanum*95 *Vitex trifolia*96 *Bixa orellana*97 *rubra*

same - roadside

98 *Eucalyptus*

same - experiment station

99 *Bauhinia blakeana*
cultivated35600 *Clodendron siphonanthum*
growing up through hedge01 *Graptophyllum pictum*
cultivated

65 m.

shrub 1.5 m. tall, sterile.

shrub 3-4 m. tall,
sterile.small tree; leaves
glaucous beneath; sterile.small tree, branches
semi-scandent and
"weeping"; sterile.shrub 2 m. tall, aromatic,
flowers violet.shrub 1.5 m. tall;
flowers pink.

"form with long pointed fruits".

aromatic shrub 3 m. tall, sterile;

tree 12 m. tall, aromatic.

shrub, flower rich
crimson-magenta;
(recently imported from
Hong Kong).calyx lobes with
margins ~~separated~~ recurved,
upper surface red.shrub 2.5 m. tall, leaves
bronze and bronze-white;
flowers dull magenta.
laterally compressed.

35602 *Graptophyllum pictum*
4 cultivated

03 *Bauhinia monandra*
cultivated

04 *Tabernaemontana divaricata*

4 05 *Ipomoea ^{crassicaulis (Swth.) Rob.} exota*
spontaneous in vacant
lot.

06 *Duranta repens*
cultivated

2 07 *Schinus terebinthifolius*
cultivated

08 *Phyllanthus acidus*
cultivated

09 *Bauhinia*
cultivated

3 10 *Acacia confusa*
cultivated

11 *Aphelandra?*
cultivated

12 *Grevillea robusta*
cultivated

13 *Miscanthus floridulus*
patch in field back of
house (no normal associated species) on limestone soil.

65m

shrub 3 m. tall; leaves
green and white;
flowers deep dull
magenta, laterally
compressed.

- tall shrub, sprawling
over house roof; flowers
pink with red blotch
on one petal.

shrub 2 m. tall;
flowers white.
"Chinese gardenia":
erect, 1.5 m. tall,
tangled; flowers
lilac.

shrub, flowers
pale violet.

shrub 1 m. tall;
flowers greenish.

- small tree, flowers
dark brick red.

shrub 3 m. tall;
flowers bright purple,
immature pods mottled
with red.

- low rounded tree,
flowers bright yellow,
fragrant.

shrub 1 m. tall,
flower scarlet.

- low spreading young
tree; sterile.

clumps 2 m. tall.

same - cultivated
in nurseries

35614 *Jasminum pubescens*

1 15 *Plumeria rubra*

3 16 *Polyscias frutescens*

1 17 *Costus*

1 18 *Iperomea guamensis*

1 19 *Hemigraphis repens*

1 21 *Kalanchoe*

1 22 *Kalanchoe*

1 23 *Thuja orientalis*

24

1 25 *Calathea*
in lath-house

1 26
in lath house

2 27 *Bauhinia*

2 28 *Bauhinia*

2 29 *Melia azadirachta*

1 30 *Begonia*
in lath house

1 31 *Sansevieria*
in pots

153

shrub, 1 m. tall, flower
white, fragrant.

fruiting freely.

shrub 1.5 m. tall.

stem spiral, 1 m. tall

flower red.

leaves veined with white.

weed in pots; flower

pale lavender.

leaves terete, mottled

leaves fleshy, flattened

erect shrub 1 m. tall,

branch systems erect.

shrub, flowers

scarlet.

leaves purple beneath,

green above with

sharp white and pink

lines.

vine, sterile; pubescent

bright purple.

shrub 3 m. tall;

flowers white with

red stamens and style.

shrub 3 m. tall;

flowers scarlet.

small tree 4 m. tall,

flowers lilac.

leaves fleshy; flowers

pink, pale within.

leaves fleshy, variegated;

sterile.

35632

acid

- 1 33 *Dieffenbachia*
 2 34 *Polyscias*
 1 35 *Polyscias tricochleatus*
 1 36 *Thunja*
 2 37 *Polyscias*
 1 38 *Euphorbia pulcherrima*
 2 39 *Griselinia officinalis*
 2 40 *Polyscias frutescens*
 2 41 *Phyllodendron*
 1 42 *Chrysophyllum caribbeum*
 same - old nursery site
 2 43 *Thunbergia grandiflora*

- 1 44 Jan. 28 - Santa Rosa Peak
Polygala paniculata
 common on eroded volcanic soil

- 1 45 Jan. 28 - ^{North} west of Harmon Field
Pennisetum purpureum
 abundant locally on cleared coral soil

45 m

- ~~erect~~ erect shrub;
 leaves variegated
 with dull gray.
 erect shrub; leaves
 green with white spots.
 shrub up to 2 m. tall;
 leaves extremely crisped.
 shrub 1.5 m. tall; leaves
 with white variegation
 around margin; sterile.
 small plant in pot.
 shrub 2 m. tall; leaves
 dark green; sterile.
 bracts scarlet.
 shrub 1 m. tall; sterile.
 shrub 2 m. tall;
 leaves variegated; sterile.
 vine; sterile.
 seedling in pot.

wine climbing over
 tree; flowers blue-
 lavender.

260 m.

flowers white.

50 m

tangled clumps 2-3 m.
 tall. (sample collected
 for silica analysis)

Jan. 29 - Pago Bay

A rather broken down swamp area with patches of *Nipa fruticans*, ~~and~~ of *Rhizophora*, of *Hibiscus tiliaceus*, tangled with *Clerodendrum inerme* and *Derris trifoliata*. Small patches and admixtures of *Phragmites*.

35645a *Burquiera conjugata*
rare, edge of stream

4 46 Patch of sword grass on hill just south of bridge
Psychotria manana
rare in sword grass on limestone slope

Miscanthus growing on brown soil on argillaceous limestone, around edges being shaded out by *Leucaena* and some *Triplaris*.

In the shade the *Miscanthus* is very loose and elongate. Some burned sticks at the top of the ridge indicate a fire not

some *Thespesia populnea* around the edges is a herbaceous vegetation of *Paspalum vaginatum* with clumps of *Cyperus javanicus* and patches of *Pennisetum purpureum*.

8 m. small tree 3-4 m. tall; calyx red. "mangle" wood said to be used for making ranchos or temporary houses.

50 m.

shrub 1 m. tall; flowers white.

too long ago, but it was long enough ago so that *Miscanthus* and *Leucaena* have grown quite luxuriantly. There is much more soil accumulated on the lower slopes in the *Leucaena* than above in the grass. Few *Leucaena* seedlings

Composition.

- a *Miscanthus floridulus*
 l₁₀ *Chrysopogon aciculatus*
 a ~~Triphasia~~ *Leucaena glauca*
 c *Triphasia trifolia*
 c *Clerodendrum inerme*
 c *Callicarpa candicans*
 lc *Stachytarpheta indica*
 lc *Cassytha filiformis*
 lc, a *Wedelia biflora*
 o *Morinda citrifolia*
 o *Psidium guajava*
 o *Ficus leontopetaloides*
 o *Psychotria mariana*
 o *Hyptis pectinata*
 o *Waltheria indica*
 o *Passiflora foetida*
 o *Ipomoea indica*
 lo *Fimbristylis obtusifolia*
 lo *Cassia occidentalis*
 ~ *Hyptis capitata*
 ~ *Lida acuta*
~~Cantharospermum~~
 ~ *Cantharospermum* scrubby

Jan. 29 Ylig Bay

The swamp here is poorly developed near

- 35647 *Miscanthus*
 4 *Cassia*
 occasional in tall grass
 4 48 ~~Cantharospermum~~
 near edges of scrub on slope

the bay, with a small patch of *Phragmites*, some *Mipa* and *Hibiscus* *villosus*. A large area is dominated by *Hibiscus* a short distance upstream. A luxuriant patch of sword-grass occupies a steep slope of argillaceous limestone above a wooded bluff south of the bridge.

- a *Miscanthus floridulus*
 a *Triphasia trifolia*
 c *Wedelia biflora* var. *canescens*
 lc *Wikstroemia foetida*
 lc *Clerodendrum inerme*
 lc ~~Clerodendrum~~ *Cassytha filiformis*
 lc *Nephrolepis bisantula*
 o *Derris trifoliata*
 o *Morinda citrifolia*
 ~ *Cassia* sp.
 ~ *Psychotria mariana*
 ~ *Ficus tinctoria*
 ~ *Premna obtusifolia*

The wooded bluff below is principally a dense thicket of *Triphasia*, with some *Hibiscus*, *Pandanus*, and *Artocarpus*.

in limestone.
60 m.

weak shrub up to 1 m. tall, flowers yellow, fruit immature shrub 7 m. tall, sterile;

Jan. 27 - Talofofo Bay
patch of sword-grass
on hill-top south of
bridge.

lustrant stand
of *Miscanthus* with
little else, on deep
red-brown soil on
argillaceous limestone.
Leucaena is encroaching
and shading it out
around the edges.

- a *Miscanthus floridulus*
la. *Leucaena glauca*
c *Clodendrum inerme*
o *Triphasia trifolia*
o *Morinda citrifolia*
o *Sida acuta*
o *Columbina asiatica*
~ *Cassia occidentalis*
~ *Indigofera tinctoria*

Jan. 30 - Umatac

Marshy place at
mouth of stream

35649

Bambusa blumeana Schult. f.
locally abundant

large clumps, culms
crowded together, up to
7 cm. thick, dark green,
hard, woody, wood
up to 1 cm. thick, internodes
getting longer upward,
to 3 dm. long; branches
abundant, solid, lower ones
making a tangled spring
mass, mostly bare of leaves.

35650

*Echinochloa*dominant locally
in mud

2

51

Eichhornia crassipes~~dominant~~ locally in mud

1

52

Iperomea aquatica

common locally in mud

5

53

~~except~~

common on moist ground

1

54

Commelina

rare on moist ground

1

55

Erotaria quinquefolia L.

rare on moist ground

1

56

Iperomea

cultivated, climbing on house

2

57

Jan. 30 - n. side Pago Valley

Bambusa vulgaris Schum. & Wend. det. McClure
in thickets

Jan. 30 - hills behind

Inarajan, n. of Inarajan
Valley

6

58

*Euphorbia*local along roadside in
volcanic soil.

2

59

local on ^{bar}eroded volcanic
breccia

0-1 m

culms decumbent
to ascending.

flowering spikes erect,
flowers purple, older
spikes bending downward
flowers lavender, dark
purple in center.
prostrate, flowers
lavender, throat closed,
all three petals blue.

erect, flowers yellow.

flowers deep red-purple.

50 m.

clumps, canes about
2-3 dm. apart; dark
green internodes up to
2.5 dm. l.

70 m.

arching, flowers white.

prostrate

Jan. 30 - just s. of
Achy Point

- 35660 *Abutilon*
common along road

Jan. 30 - Achang Bay,
east of Merizo
Mangrove Swamp

- 3 61 *Xylocarpus granatus*
rare along shore
3 62 *Avicennia*
rare along shore

Jan. 30 ~~Merizo~~

- 6 63 *Enhalus acoroides*
forming large beds
in shallow water of
lagoon, sandy mud
bottom

Jan. 30 - Merizo

- 3 64 *Rhizophora mucronata*
common on muddy
shore of inlet
3 65 *Sporobolus virginicus*
dominant all along
beach, forming a belt
just above high tide.
3 66 ~~Abutilon~~ *Albizia lebbekii*
in school yard
6 67 ~~Abutilon~~
common along roadside
and weedy places

shrub 2 m. tall, stems
red, flowers opening
out flat, pale orange.
2 m.

small tree, sterile

shrub 1.5 m. tall,
leaves pale yellowish
green; sterile.

rhizomes buried in
mud; sterile.
- 1 m.

small tree; flowers
white.
2 m.

forming a sod.
1 m.

small spreading
tree, pods pendent.
2 m.

shrub 1 m. tall;
flowers orange.
1 m.

- 35668 *Pinostoma chinensis*
cultivated

Jan. 31 - top of cliff ~~at~~
above Tarague Beach

- c 69 *Hedyotis foetida* var. *marianensis*
common on bare limestone
ledges.

- i 70 *Digitaria gaudichaudii*
rare on bare rock ledges.

- s 71 *Bidens pilosa* var. *radiata*
abundant on roadsides
and cleared or scraped
areas on limestone.

- r 72 *Ipomoea tuba*
occasional in brush at
top of cliff.

same - in thick forest
on slope at bottom of cliff

- c 73 *Psychotria*
rare

2 m.

tree about 4⁵ m. tall,
trunk without definite
scars, but with
ringlike roughening
near the top. panicle
axillary; fruit dull
greenish, turning black,
panicles arching
out and somewhat
downward.

140 m.

small compact rounded
much branched bush,
malodorous when broken;
flowers white, anthers
dark gray.

branched herbs to
0.7 m. tall, rays white.

vine, flower white.

70-80 m.

shrub 2 m. tall; fruit
immature

- Jan. 31 - Tarague Beach
- 35674 *Lepturus repens* var. *subulata* Presl. 1 m. alt.
common on sand
- 75 *Cenchrus brownii* 1 m.
rare on sand
- 76 *Gymnodore* - 1 m.
rare, two small patches
seen on sand bottom
in about 1 m. water

Jan. 21 - east of Agaña
secondary forest
with, locally, a few
big trees of *Elaeocarpus*
fair sized ones of *Clavoxylon*
Ochrosia, *Aglara*, etc.
with fairly complete
canopy at about 10 m.
Walking is not too bad
without machete, but
easier with one.

Composition:

- c *Aglara mariannensis*
- c *Ficus prolixa*
- c *Clavoxylon mariannensis*
- c *Guamnia ~~mariannensis~~*
- c *Hibiscus tiliaceus*
- c *Ochrosia oppositifolia*
- c *Pandanus tectorius*
- c *Flagellaria indica*
- c *Triphasia trifolia*
- o *Elaeocarpus foga*
- o *Artocarpus altilis*

forming loose mat.

stems prostrate.

forming dense sod
which collects sand;
sterile.

- o *Morinda citrifolia*
- o *Maytenus*
- o *Melanolepis multiglandulosa*
- o *Carica papaya*
- c *Piper guahamense*
- c *Discothalys*
- ferns - terrestrial
- Nephrolepis bisantula*
- ferns - epiphytic
- Davallia solida*
- Asplenium nidus*
- Polypodium punctatum*
- Polypodium scolopendria*
- Asplenium laciniifolium*
- Asplenium falcatum*
- Belvisia spicata*
- Bumata heterophylla*
- Nephrolepis acutifolia*
- Antrophyum serrulatum*
- Vittaria elongata*
- other epiphytes
- Diclidia*
- various orchids.

along recently cleared roadways in this woods is a community dominated by *Carica papaya*. This always seems to be the thing to occupy a fresh clearing in the forest.

With it are various minor weeds, *Asclepias curassavica* and especially *Nephrolepis hirsutula* are conspicuous, and vines of *Ipomoea indica* and *Paeolobus boitardii* are common. This is a ruderal community seen very commonly in the plateau forest immediately following disturbance.

Jan 22 - Anao.

Area proposed to governa Elodge to be set aside as conservation reserve - extending from Anao Point south, and from south boundary of Anderson AFB south, east of Calvo and Blas properties.

Examined in company of Calvo + Blas.

Made up of an area of plateau top, the "rampart" at the edge of the cliff, the cliff face and steep slope below, and two terraces, one just above the sea.

The plateau top is mostly in rather good forest, though part of the area has a large number of dead trees. In the part examined these were mostly *Intsia*, and are said by the local people to be affected by "bugs" both in roots and tops. *Intsia* present, which are essentially leafless - this said by the local people to be normal condition of large "ipil" trees. This forest is remarkable for its almost complete lack of *Artocarpus* trees, which are dominant on most parts of the plateau.

which remain wooded. Certain parts of this forest were apparently cleared as they are now filled by *Macaranga* seedling, 3-4 m. tall. Acc. Calvo and Blas cleared by Japanese.

Composition of reasonably intact portion:

- c *Clasylon marianensis*
- c *Ochrocarpos odoratus*
- c *Aglaia marianensis*
- c *Ochrosia oppositifolia*
- c *Guamia marianensis*
- c *Cycas circinalis*
- c *Carica papaya*
- o *Pseudomorus bunuriana*
- o *Triphasia trifolia*
- o *Pandanus dubius*
- o *Intsia bijuga*
- c *Tristropsis*
- o *Morinda citrifolia*
- o *Laportea latifolia*
- o *Cynometra*
- c *Premna ~~saua~~ obtusifolia*
- o *Psychotria mariana*
- o *Pandanus tectorius*
- o *Macaranga*
- o *Clasocarpus zoga*
- o *Hibiscus tiliaceus*
- o *Pouteria*
- ~ *Allophylus*
- ~ *Ipomoea triantha*

Nephrolepis hirsutula
Polypodium scolopendria
Alysicia torresiana
Piper guahamense
Davallia solida
Dryopteris

Undergrowth is not generally too thick to walk through, at least with a relatively small amount of cutting.

The 'rampart' or cliff edge is covered by a scrub, ~~by~~ largely made up of:

- a *Triphasia trifolia*
- a *Polypodium scolopendria*
- c *Cynometra*
- c *Asplenium nidus*
- o *Psychotria mariana*
- o *Ficus protixa*
- o *Cycas circinalis*
- o *Premna obtusifolia*

The steep rock slope of the cliff has a scrubby forest, apparently relatively undisturbed, of:

- a *Ochrocarpos odoratus*
- c *Cycas circinalis*
- c *Guamia marianensis*
- c *Quettarda speciosa*
- c *Blechnum marianensis*
- c *Guamia marianensis*

- c ~~Cycas~~ *Colubrina asiatica*
- c *Chynometra*
- c *Triphasia trifolia*
- o *Ochrasia oppositifolia*
- o *Ficus prolixa*
- ~~a *Guammaria marianensis*~~
- r *Grewia*
- and with smaller plants:
- a *Asplenium caudatum*
- a *Phyllanthus marianensis*
- o *Nephrolepis hirsutulus*
- o *Polypodium scolopendria*
- o *Peperomia*
- o *Jasminum simplicifolium*
- r *Polyscias grandifolia*
- o *Alyxia ruscifolia*
- Asplenium nidus*
- Procris pedunculata*

Forest on slopes at foot of cliff:

- a *Occhocarpus odoratus*
- c *Aglaia mariannensis*
- c *Guetarda speciosa*
- c *Hibiscus tiliaceus* (a in lower part)
- c *Cycas circinalis*
- c *Triphasia trifolia*
- o *Morinda citrifolia*
- v *Intsia bijuga*
- o *Carica papaya*
- o *Ficus prolixa*
- o *Melanolepis multiglandulosa*
- o *Polypodium scolopendria*

The upper terrace is covered by *Hibiscus tiliaceus* with scattered coconut trees, with much *Triphasia trifolia*. The soil is brown.

During the war much of it was cleared and planted to bananas. Opening now covered by thickets of *Triphasia* and *Clerodendrum inerme*.

The lower terrace is karrenfeld (the term "baranca" is used for karrenfeld by Guamanians) about 50 m. wide, inside of which is a gentle slope of gravel.

The karrenfeld is covered by a discontinuous low matted vegetation of

- a *Pemphis acidula*
- c *Fimbristylis*
- o *Heliotropium anomalum*
- o *Hedyotis albido-punctata*
- o *Leaevola* seedlings
- r *Euphorbia tinianensis*

There are some patches of open ~~and~~ gravel. On this are seedlings of *Leucaena glauca*, scattered, gnarled 3-4 inches tall.

Inside the karasmpelo is a discontinuous belt of Casuarina with a little Pisonia, partly replaced by a scrub 1-2 m. tall of Scaevola and Wedelia. Under the Casuarina is bare ground covered by a bed of bare needles and scattered Achyranthes aspera and Callicarpa candida and Capparis cordata.

Inside this is a belt of Hibiscus tiliaceus and Clerodendrum inerme about 2-3 m. tall.

Manuel Calvo and Joaquin Blas gave me many vernacular names and some other information on plants seen: (determinations are my sight ones)

Faia - Tristropsis
trunk always straight, used ~~as~~ for lumber.
most of dead ^{and dying} trees seen were this, said to be from insect attacks both on roots and tops, acc. Blas.

Ahgal - Premna obtusifolia
Mahupa - Eugenia javanica
~~Lavate~~ - fruit eaten
Laviti - Blechnum marianense

Sosgo - Glochidion marianense
Katuk labi - Claoxylon marianense
dry bark said to make skin itch.

Lada - Morinda citrifolia
lanav - Guettarda speciosa

Hodda - Ficus tinctoria

~~Fago~~ fruit eaten

Fago - Ochrosia oppositifolia
seed eaten

Pupulo aniti - Piper guahamense
(Pupulo - Piper beetle)

Mapuno - Aglaia marianensis

Paipai - Giamnia marianensis
wood used for forins
handles and rafters.

Federico - } Cycas circinalis

Fadang - }
Aplok kating - Psychotria
mariana

Ahmahagan - Pipturus argenteus
bark scraped off and
applied to boils.

Angilo - Grewia
wood very flexible,
used for houses.

Guagnahot - Isora triantha

Agatelana - Eugenia sp.

Pengua - Macaranga thompsoni
wood used for firewood
and building lumber.

Chopag - Ochrocarpos odoratus
Katuk palawan - Sapotia latifolia
bark said to sting skin
when dry. (Palawan woman)

Sumac - *Randia cochinchinensis*
 Otot - *Discocalyx*
 fruit edible

Gulus - *Cynometra*

Ledesun - *Alysicarpus torresianus*
Morinda umbellata

Jasminum simplicifolium

vines said to be very strong, three different kinds

Ifil - *Intsia bijuga*
 much logged before war. stumps and some logs still lying around from 1918 (acc. Blas), those examined not much rotted. Taken out on sleds pulled by carabao.

Tupunayuzan - *Procris palmiculata*
 transl. "coconut crab sugar cane"

Pot puput - *Dischidius*
Peperomia

two kinds recognized, the *Peperomia* used medicinally

Lulubut - *Maytenus*

Laso katu - *Achyranthes aspera*

Gasusu - *Colubina asiatica*

Ledegan - *Clerodendrum inerme*
 Tea of dry leaves used for high fevers.

Noolung - *Pisonia grandis*

Am-lat - *Callicarpa cordata*

Atapanis - *Capparis cordata*

Lanaru - *Scaevola frutescens*

Iniqas - *Symphoricarpos acidula*

Tangantangan - *Leucaena glauca*

Piga - *Alocasia* (with green edible petioles)

Papan - *Alocasia* (with brown inedible mottled stem)

Alum - *Melanolepis multiflora*

Fags - *Ochroma oppositifolia*

Pakam - *Caesalpinia major*

Bihuen naturalium -

Flagellaria indica

transl. "wild wicker"

(to contrast with an introduced bihuen from Philippine used in handicraft)

Murmutum - *Pipturus pectinatus*

Jan. 22 - Naval Air Station

Agaña Nursery

(see p. 122)

Plants observed in the nursery
- mostly planting material
destined for planting on the
Air Station.

*Bougainvillea glabra**Barleria cristata**Gaillardia picta**Rhoeo discolor**Celosia argentea**Impatiens balsamina**Catharanthus rosea**Phyllanthus niruri**Euphorbia pulcherrima**Tagetes**Coleus scutellaria**Polyciss guilfoylei**Gambusia sp.**Pseuderanthemum* (various)*Codiaeum variegatum**Plumeria rubra**Pedilanthus tithymaloides**Lancea roxburghiana**Polyciss scutellaria**Polyciss fruticosa**Hibiscus* (ornamental hybrids)*Leindapsus aureus**Acalypha sp.**Zebra pendula**Hemigraphis repens**Eugenia indica**Ficus pumila*

Cassia glauca
Adenanthura pavonina
Pelicania sp.
Impatiens balsamina

*Hedychium sp.**Nerium sp.**Acalypha hispida**Capricorn frutescens**Gardenia jasminoides**Canna sp.**Crinum arifolium**Zephyranthes candida**Caladium bicolor**Ipomoea quamoclit**Caesalpinia pulcherrima**Polianthes tuberosa**Lambucus canadensis**Jatropha multifida**Zinnia elegans**Gomphrena globosa**Heliconia bihai**Acalypha amentacea* var. *willbesiana**Casuarina equisetifolia**Cordyline terminalis**Malvarisum**Graptophyllum pictum**Lamanea samana**Terminalia catappa**Erythrina variegata**Acacia confusa**Bixa orellana**Cassia alata**Barringtonia asiatica**Cocos nucifera**Catalpa longissima**Cassia fistula**Xanthosoma sagittifolia**Punica granatum**Alpinia spectabilis*

Jan. 27 - Com Mar Nursery
upper Fonte Valley (see p. 146)
Nursery to supply
planting material for
Com. Nav. Marianas
establishment. Plants
not listed except a
few not generally
noticed elsewhere.

Tabebuia pentaphylla
"Kentia" palm
Tithonia diversifolia
Cassia fistula
Ixora coccinea
Ixora coccinea
Roystonia oleracea

Jan. 27 - Mangunas
"Guam Florist" nursery
(see p. 152) and other
establishments in the
neighborhood (Experiment
Station, homes of employees,
nursery of

Veronica names supplied
by owners of Guam Florist.

Bagaria spp.
Leindapsus aureus
Phyllodendron spp.
Phoenix sylvestris? (small)
Vanda x *Miss Joaquin*
Monstera deliciosa

Araucaria excelsa
Impatiens sultana
Trachycarpus excelsus?
Chamaecyparis humilis?
Strelitzia reginae
Pelargonium zonale
Gardenia jasminoides
Tabebuia pentaphylla
Diospyros maculata
Vitis sp. (sterile)
Pellionia pulchella
Brassia actinophylla
Murraya paniculata
Spathiphyllum 3 sp.
Anthurium
Lindernia (a *Lindernia*?) *angustifolia*
Calathea (with sharp pink stripe)
Oxalis martiana
Raphidophora (a *Epiphyllum*)
Lanseria cylindrica
Kalanchoe (small sp.)
Kalanchoe (large triangular sp. 2' diam. L.)
Haworthia (dichotoma)
Aloe sp.
Thuja orientalis
Plumbago rubra - *calceolaria*
Alpinia purpurata
Nephrolepis cordata
Ixora coccinea
Nephrolepis biseriata v. *furcata*
Thevetia peruviana
Agave sisalana (but with
no prickles and soft blunt points)
Melia azedarach - *paraiso*
Caesalpinia pulcherrima - *caballero*

~~Mitella~~

Malvaceae

"sleeping hibiscus"

Jasminum pubescens

- sampagita

Chrysalydocrapso latuacem

Cyphomandra

Bauhinia blakeana

(brought to Esp. Sta. from
Hongkong, spoken of at
Esp. Sta. as a hybrid)Jan. 23 - Faraychan Tro
and adjacent middle
Talofofa River basin.
(coll. from p. 129)Ravine forest type on rougher
areas, levelled areas
of upland are generally
covered by sword-grass.
The sword-grass areas are
more or less badly cut by
erosion scars. These rather
red.The Miscanthus commu-
nity here is pure
Miscanthus, except
in thin places and small
openings. It has been
burned an old blackened
grass stubs show. No
Casuarina seen. In thin
places and small openings
may be found:

- c Hyptis capitata
- a Chrysopogon aciculatus
- c Cuscuta ochroleuca
- bc Mitracarpum hirtum
- c Dimeris chloridiformis
- o Sporobolus elongatus
- o Paspalum orbiculare

In a small cleared
area of brownish-red soil,
in sword grass the following
made up an irregular
secondary herbaceous vegetation

- 1a *Chrysopogon aciculatus*
- 1a *Mitracarpum hirtum*
- 1c *Waltheria indica*
- 1c *Hypolepis capitata*
- 1c *Stachytarpheta indica*

The lowest part of the basin, along the river is a complex of swamp forest and reed marsh, separated from the river by a broad low natural levee. This levee is covered mainly by *Hibiscus tiliaceus* with occasional *Areca* and a few *Hernandia sonchifolia* (?). The swamp forest is a mosaic with some pure *Barringtonia racemosa*, the trees on ^{small} hummocks separated by knee-deep water. Canopy generally complete, no undergrowth. Fallen trees & branches occasional. Some *Hibiscus tiliaceus*, almost a pure stand, some mixed.

- a *Barringtonia racemosa*
- a *Areca cathecu*
- c *Pandanus tectorius*
- Barringtonia* seedlings abundant, also *Alocasia* and *Oplismenus* on ground.
- Patches of reed swamp.

In this flat low ground are occasional knobs of volcanic breccia (Pele's formation) partly covered by sword-grass, partly by ravine forest and scrub.

The flats just above the swamp have *Areca* groves with some *Hibiscus tiliaceus* and with thin undergrowth of *Piper guahamense*.

The ravines running into this all around have ravine forest, largely *Hibiscus tiliaceus*, but with *Pandanus*, *Cycas*, *Areca*, *Ficus polina*, *Triplaris*, etc.

Jan. 23 - Dan Dan (Miss)
(Miss) (Miss)

Jan. 23 - West of Yigo
Inspection, with Manuel
Calvo, Commissioner of Yigo,
of sites for a conservation
reserve of *Artocarpus*
"dugdug" forest.

A block of about 20
hectares located perhaps
 $\frac{1}{2}$ km. ~~west~~ west of highway
along the old road - broken,
rather ragged forest,
about $\frac{1}{3}$ clearing, $\frac{1}{3}$ thick
mixed secondary forest,
largely *Pandanus*,
and about $\frac{1}{3}$ *Artocarpus*.
Some trees are 5-7 dm.
thick. Canopy not
very good. Not an
ideal spot for a reserve.

Another block about
1 km. in from road (across
from Jose White property)
runs along a ridge of
rocky ground (karena
field). It is thick secondary
forest, with a strip
about 100 m. wide along
~~with~~ side with many
large dugdug trees. The
rest is good mixed
secondary woods.

This has been
cut into small
parcels by bulldozing
roads along the sides
and across. This was
done about 2 months
previously. The cleared
strips are dominated by
a dense stand of *Carica*
papaya about 1-2 m. tall.

Native names acc. Calvo
Promelia pes-caprae - Malaihai
Promelia lilifolia - Alalak

Jan. 28 - Mt. Santa Rosa
Farm of Mr. Jose -
2 trees of *Phoenix dactylifera*
5 and 2 years old, raised
from seed.

Agave americana (stink)
Pineapple field of about
30,000 plants, smooth
cayenne, started in 1937.
Parts of field quite healthy,
but some spots very
poor - look as though
they have iron chlorosis,
plants dwarfed as well
as yellowish. Owner
thinks it is due to ground
being too wet. Fruit not
in season now but owner found
one for me which was excellent.

Most of Mt. Santa Rosa is covered by swordgrass, much of it somewhat disturbed by war activity. There is some *Dimeria* grassland, but most of the area is *Miscanthus* and erosion scars.

Composition in *Miscanthus* area and smaller disturbed places:

- a *Miscanthus* ~~sp~~ *floridulus*
- la *Elephantopus mollis*
- la *Stachytarpheta indica*
- la *Gleichenia linearis*
- c *Hypochaeris capitata*
- c *Glochidion marianum*
- c *Leucaena glauca*
- c *Ernilia javanica*
- lc *Nephrolepis hirsutula*
- lc *Polygala paniculata*
- lc *Mitracarpum hirtum*
- lc *Curculigo orchioides*
- lc *Lygodium scandens*
- lc *Ageratum conyzoides*
- alc *Dianella*
- o *Dimeria chloridiformis*
- l *Thaarea ^{involuta} ~~sarmentosa~~*
- l *Cenchrus echinatus*
- r *Ipomoea littoralis*
- r *Pandanus tectorius*
- r *Cheilanthes tenuifolia*
- Leacvola frutescens*
- Pennisetum polystachyum*

Sida acuta
Chrysopsis aciculatus
Ocimum triflorum
Psidium guajava
Phragmites Karla (in ravine)

Small areas of *Dimeria* seem to be not significantly different physiographically from the *Miscanthus* areas.

- la *Waltheria indica*
- lc *Paspalum orbiculare*
- lc *Rhynchospora rubra*
- o *Fimbristylis annua*
- o *Fimbristylis sp. (sp.)*
- l *Fimbristylis cynosu*
- r *Wikstroemia elliptica*
- r *Myrtella banyanensis*
- r *Geniostoma*
- r *Jasminum simplicifolium*

Jan. 23 - road south of
Pago Bay, near Yona
Small heron (sort of often
seen in various parts)
found recently dead
along road. Rough description:

About 11-12" total length.
Beak about $1\frac{1}{4}$ - $1\frac{1}{2}$ inches. Crown
dark lead-gray; naked
yellow patch around eye.
Primaries, ~~and~~ secondaries,
lead-gray and tail
back dull reddish brown;
Wing coverts buff-tan; under
parts white washed with
tan; under side of wings
white; feet bronze yellow,
claws dull pinkish.

[Least bittern acc. Richardson]

Jan. 30 - Merizo

Trachycarpus excelsus
& *Livistona chinensis*
planted in village.

Mangrove swamp
in east part of village.
Flats of *Paspalum vaginatum*
in swamp.

Rhizophora & *Thespesia*
dominant, with *Heritiera*,
Hibiscus tiliaceus, *Bruguiera*,
and *Clerodendrum inerme*.

East of Merizo the
strand is lined with
Thespesia, etc. Coral terrace
just above high tide,
with occasional low
Pemphis bushes. Back of
this is a little sand
with a belt of *Sporobolus*
virginicus. Back of this
is a belt of *Thuarea*, with
some *Ipomoea pes-caprae*,
just in front of and
under edges of trees.

The flat behind this
is of shiroya soil - weedy,
with *Pandanus*, *Leucaena*,
Guettarda, *Musa*,
Pithecellobium, *Carex*,
under sparse coconuts.
A few breadfruit trees
and *Triphasia* clumps.
Principal weeds are:

Stachytarpheta indica
Sida rhombifolia
Urena lobata
Hydnellia nodiflora
Ipomoea pes-caprae
Thuarea involuta
Chrysopogon aciculatus
Paspalum conjugatum
Vernonia cinerea

Jan. 30 farther east of Merizo.

Stand of young mangroves, both *Rhizophora* and *Bruguiera*, in shallow water outside of fragmented coral terrace. Perhaps $\frac{1}{3}$ are *Bruguiera* and $\frac{2}{3}$ *Rhizophora*. Along the shore are a few *Xylocarpus*, *Thespesia*, *Hibiscus tiliaceus*, *Heritiera*, *Avicennia*, and *Hernandia*, with *Clodendrum inerme*, *Derris trifoliata*, and *Cassia* sp.

The entire bay here is lined thus - scarcely a mangrove swamp, but rather a mangrove-lined shore. The mangrove trees in shallow open water are all young.

At the head of the bay are larger trees, forming a more typical mangrove swamp. Some ~~*Acrostichum*~~ *Acrostichum aureum* here.

To the east are some reeds. Mangroves seem to be colonizing eastward, in the shelter of the barrier reef which extends out to Cocos Island. The shore here is protected

from beach erosion by a heavy sod of *Paspalum* or *Sporobolus* (sterile) which extends eastward. *Enhalus acoroides* very common in shallow water inside reef, forming patches which seem to collect some fine sediment.

Jan. 31 - Tarague Beach

The wooded terrace above the coconut plantation covered by a somewhat degraded mixed forest of:

- a *Occhrosia oppositifolia*
- a *Cycas circinalis*
- c *Aglaia mariannensis*
- c *Macaranga thompsonii*
- c *Pandanus tectorius*
- c *Morinda citrifolia*
- c *Premna obtusifolia*
- o *Ficus prolixa*
- o *Artocarpus altilis*
- o *Guarea mariannensis*
- o *Triphasia trifolia*
- o *Cestrum diurnum*
- o *Flagellaria indica*
- o *Melanolepis multiglandulosa*
- o *Carica papaya*
- o *Piper guahamense*
- o *Eugenia reinwardtiana*
- r *Cordia subcordata*
- r *Intsia bijuga*.

This forest is on a shallow yellow-brown soil on a low karrenfeld. Many trees are dead or with dead tops. The canopy is perhaps 80% complete. Walking is easy through an understory 1-4 m. high, chiefly *Cycas*, with *Morinda citrifolia*, *Guamra flagellaria*, *Piper*, young *Ocotea*, etc. Vascular epiphytes are few - *Polypodium punctatum*, *Pyrosia lanceolata* and *Nephrolepis acutifolia* being seen but not abundantly.

On steep slopes at foot of cliffs *Cordia* becomes common to abundant, and *Cynometra*, *Dioscorea*, *Psychotria*, *Maytenus*, *Croton*, *grandis*, *Psychotria malaspinae*, and *Pipturus argenteus* are additional species. The forest is lower, *Ocotea* is no longer abundant but only occasional. The limbs of *Cordia* are tangled just above ground, making progress on foot locally difficult.

On the cliff above is a scrub composed of
Bikbia mariannensis
Leavenworthia putrescens
Triphasia trifolia
Phyllanthus mariannensis
Ochroma odorata
Hedyotis foetida
Cestrum diurnum
Pisonia grandis
Cycas circinalis
Psychotria mariana
Pipturus argenteus
 Some bare rock shows.

Jan. 31 - Ritidian Point - trail down cliff just south of point.

The forest here is rather uneven and appears to have been somewhat disturbed. On the main terrace (2nd above sea) there has at sometime been considerable clearing. The flats just above the beach have been planted to coconuts.

The general composition on cliffs and terraces is:
Artocarpus altilis
Claoxylon
Guamia mariannensis

- c *Cynometra*
 c *Pandanus tectorius*
 c *Cycas circinalis*
 c *Aglaia mariannensis*
 c *Viphasia trifolia*
 c *Premna obtusifolia*
 c *Macaranga thompsonii*
 c *Occhrosia oppositifolia*
 c *Chytranthus marianensis*
 c *Tectaria crenata*
 la *Tristropsis* (lower than)
 o *Entsia bijuga*
 o *Blechnum marianensis*
 c *Ficus prolixa*
 c *Guettarda speciosa*
 bc *Pipturus argenteus*
 ~ *Ficus tinctoria*
 ~ *Acacia leucopetaloides*
 ~ *Carica papaya*
 ~ *Flagellaria indica*
 ~ *Piper guahamense*
 ~ *Melochia*
 ~ *Rapanea latifolia*
 ~ *Pisonia grandis* (lower than)
 ~ *Hernandia sonora* (lower than)

Maytenus thompsonii
Polypodium pumilatum
Maranta arundinacea
Psychotria mariana

The beach here is broad and sandy, and in front of the coconut grove lined with:
 a *Casuarina equisetifolia*
 a *Messerschmidia argentea*
 a *Scaevola frutescens*
 o *Pandanus tectorius*
 o *Hernandia sonora*

Onigodug (Lantana) - wood much finer grained than breadfruit. Can also soft like sugar pine or white pine in workability.

Feb. 3 - Talked with Kipp about Guam timbers:

Faya (*Tristropsis*) - twists and warps, OK for timbers but not for lumber.

Palomaria (*Calophyllum*) - probably the strongest timber here for its weight - won't split - cross-grained & braided structure.

Joga (*Elacocarpus*) - not known to Kipp.

Ifil - good timber, lasts well - Foundation upward of 150 years old still sound. Known to stay sound for at least 400 years in Philippines in contact with ground corrodes steel screws and nails.

Claude Fowler (BPM) is man who found fossil palm wood seen in 1950 - in Fena River area above Dam. Kipp also found some on road to Fena. Layer 6-12 inches thick of lignite in road cut in Naval ammunition dump area.

May 1954
Polygonum prurioides
Centropogon striatipes
Centropogon striatipes

1954

Guam

Jan. 20, 1954.

Low altitude flight in cabin plane with Tracey and Stensland to study vegetation pattern of island, crossing the island many times in different directions and across different parts, finally following the entire east and north coasts and circling several times around the loop on the northern plateau, especially studying the position of the two volcanic outcrops west of Mt. Santa Rosa.

Flat back of Tusoan Beach--coconut groves and some open ground, more coconuts than show on my veg. map.

Back of small point north of Grote--more grassland than on my veg. map.

Mangrove swamp in bay is mostly *Avicennia*.

Strip north of Base 18 is ravine forest, mostly of *Hibiscus tiliaceus*.

On top of Mt. Alifan, or near top, is a patch of sword-grass.

Setti Valley bottom covered by coconut plantation.

Merizo Valley has coconuts in lower parts, ravine forest in upper parts. All of the valleys in the southern part have considerable coconuts. There are coconut patches even in the most remote parts of the southern half of the island, also bamboo clumps but these are not as numerous. These seem to show that there were once human habitations or at least farms or cultivated patches in the remotest interior valleys and stream headwaters. From the air roads show a finer texture than sword-grass, which is clumpy. *Dacrydium* is even finer.

In some areas in the volcanic part *Dacrydium* actually forms a forest that covers the ground as viewed from the air.

The north shoulder of Con-Marinas Hill should be indicated on the map as relatively good limestone forest, not completely altered.

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In patch of woods at head of south branch of Pago River all large trees look dead, as though at some time there had been a fire. Flats south of Talofofo Bay have extensive coconut plantations.

Small lakes in Boga limestone area are surrounded by belts of reeds.

South of Orote Pk. in most of the flat valley bottoms are traces of old rice patches in the marshland. Marked by rectangular pattern. Apparently date from Japanese occupation.

In Naval Magazine area are patches of Lencuena. On east side of Mt. Lamlam a fairly large reed marsh.

In Talofofo River Basin the coconut area extends about one third the way down from Fena Dan. Below this is swamp forest.

Slumping is evident below all erosion scars on any sort of slope in volcanic part.

In Dan Dan (Martinez Pasture) all the drainage runs east from the western scarp or series of erosion scars.

In the southeast corner of the island is much Dimeria grassland.

The terrace forests north of Talofofo to Togcha should be indicated as good limestone forest on my vegetation map. This also reaches down from the north to the north side of Pago Bay.

The plateau east of Marbo has large numbers of dead trees. The forest just south of Anderson A.F.B. seems almost entirely dead. East and north of Anderson it seems in fairly good shape, quite poor west of Anderson. The only good patch in the extreme north part of the Loop is opposite the east end of Tarague Beach. Good forest north of Northwest Field east of Ritidian Point. There is good forest just west of Matagunc Hill. The grassy area on Matagunc is smaller than on my veg. map.

May 1954. Thompson
Lecythis pinnata
Miconia citrifolia
Psychotria maritima

May 2nd Thompson
 Polychaete
 Siphon elongated
 Pseudosquilla

of 8

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 Polychaete
 Siphon elongated
 Pseudosquilla

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