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Collection and Field Note Book

No. 38

(December 29, 1953 - February 3, 1954)

(35324 - 35676)

GUAM

	<u>Page No.</u>
Lost River Gauging Station, USGS	1
Tutujan, Agaña cultivated plants	2-3
Lower Fonte River 35324-35325 ...	4
Mt. Lamlam 35326-35336 ...	4-7
Base of Orote Peninsula 35337-35339 ...	8-9
Tutujan 35340-35341 ...	10-11
Wettengel Junction 35342-35344 ...	10-11
Tamuning 35345-35356 ...	10-13
Trail to Tweed's Caves, Haputo 35357-35361 ..	12-17
Top of Mt. Lamlam 35363 - 35365 ..	16-17
Ylig Bay 35366	16-17
Mt. Lamlam, summit plateau	18
Larger trees	19-20
Jumujong Manglo Volcanic peak	21-23
Apra Heights	24-26
Pago Bay	26-29
Chalandao Mt. 35367-37379a ..	30-33
Mt. Jumujong Manglo 35380	32-33
North of Wettengel Junction and Northwest Field 35381-35390 ...	32-35
Anderson Field 35391-35397 ...	36-37
Yigo and Sasa Valley ... 35398-35410 ...	36-41
Chalandao Mountain s.e. of Jumujong Manglo Yigo and between Agaña et Yigo	40-44
Anderson Airforce Base Nursery	45-49
Mt. Makejmo, ridge south of Fonte River	50-51
Sasa Valley and Mesita south of Agat.....	52
Pago Bay to Umatoc, by car	52-54
	54-55

GUAM

	<u>Page No.</u>
Umatoc	56-57
Information from Joe Santiago	57-62
Umatoc, water point ... 35411-35425...	62-67
South to southeast of Umatoc.....	68-79
..... 35426-35444...	
Merizo Annex and road between Merizo and Inarajan 35445-35447...	78-85
Martinez Pasture Dan Dan.....	86
Mataguac Spring, w. of Mt. Santa Rosa	87
Forest around Pago Bay 35448-35454 ...	88
South bank of Talofofu River and west of Mapao 35448-35461 ..	88-95
Tarague Beach 35462	96-97
South of Campanaya Point (Sassaguan Pt.)	98-103
" " " 35463-35475 .. }	
South of Taguac, on north plateau 35476-35485 ...	104-106
South east of Agafo Gumas, center of north plateau 35486-35489 ..	107-108
Asan 35490	108-109
South ridge of Mt. Alifan 35491-35496	110-111
North slopes of Mt. Almagosa	110-111
..... 35497-35499	
East of Mt. Alifan..... 35499a-35503	112-114
Near Mt. Almagosa and on Mt. Alifan...	114-117
Tumon Beach	118-119
North east of Yigo, east of Agafo Gumas, and Naval Air Station, Agaña, nur- sery..... 35504-35512 ..	120-121
Anao, Mt. Santa Rosa, Yigo	122-127
..... 35513-35534 ..	
Talofofu Village, Maagos River, Talofofu System, Fanagchon Toro, Camfranaya Point 35535-35542 ..	126-131

24285
Fisher Mission no.

Collection and Field Note Book

- 2 -

No. 38 (con't)

GUAMPage No.

Tamuning, Dan Dan, Laguas	132-139
..... 35543-35565	
Aguada River, south of Orote Peninsula	
..... 35566-35579	140-145
Orote Peninsula, Fonte Hill, Manguuao,	
Santa Rosa Peak, Hamson Field...	
..... 35580-35645	146-155
Pago Bay, Ylig Bay, Talofofa Bay,	
Umatoc, Pago Valley, hills north of	
Inarajan Valley, Acho Point,	
Achang Bay, Meriso 35645a-35668	156-167
Cliff above Tarague Beach, east of	
Agafa Gumas 35669-35676	166-170
Anso	171-179
Naval Air Station, Agaña Nursery ...	180-181
Comp Mar Nursery, Manguuao	182-184
Fanagchon Toro	185-187
West of Yigo, Mt. Santa Rosa	188-191
Near Yona, Meriso, Tarague Beach ...	192-197
Ritidian Point	197-198
Talk with Kipp about Guam timbers...	199
Résumé about Guam	200

Falsely
 24285
 Peninsular no.
 8

Fisher *720-2000*

24285 _____ 16

24942 _____ 15
(also Fisher)

25527 _____ 16

26154 _____ 17

26790 _____ 18
also Oakley, Thomas, Higgins, etc & others

31155 _____ 26

31783 _____ 27

32468 _____ 28

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35324	_____	38

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1953 - Guam

1

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

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 tectorius*
- + *Pandanus dubius*
- e *Cycas circinalis*
- o *Araucaria*
- c *Dysoxylum nuanetsis*
- o *Occhrosia oppositifolia*
- c *Hibiscus tiliaceus*
- o *Antiarpus altissimus* (cult. form)
- c *Musa sapientum*

1953 Guam

- c *Cestrum diurnum*
- c *Triphasia trifolia*
- c *Alocasia macrorrhiza*
- o *Morinda citrifolia*
- o *Inisia bijuga*
- v *Muntingia calabura*
- c *Piper guahumense*
- o *Freyrieta 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 cusata* (Thompson flower)
- Tabernaemontana coronaria*
- Cocos nucifera*
- Solanum lycopersicum*
- Plumeria rubra*
- Lactuca sativa*
- Phaseolus lunatus*
- Cucumis sativa*

- Citrullus vulgaris*
- Careca papaya*
- Pedilanthus tithymaloides*
- Raphanus sativus*
- Allium cepa*
- Psophocarpus tetragonolobus*
- Solanandra guttata*
- Solanum melongena*
- Capricum frutescens*
- Hibiscus sabdariffa*
- Frankia?*
- Hedyclium 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. ^{W. Hall.}
~~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

500

stem barrel-shaped,
pods 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.

200

decumbent

385 m.

extensive tangled vines;
flowers pendent, pale
green, hairs on calyxes
irritating.
shrub 2 m. tall; ~~fruit~~
leaves very rugose;
flowers green, fruiting
involucres yellowish,
slightly fleshy.

1953 Guam

35779 *Pisonia cauliflora*
rare in broken-down forest

15

30 *Tarenna*
rare in forest

31 *Maesa*
rare in forest

32 *Ficus prolixa*
common in forest

33 *Ficus prolixa*
common in forest

34 *Hemata 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 on only on very flat growing branchlets. (7-ventriculate Mem.)
— fronds glossy.

pendent

glossy

1959^d Guam

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

35737

Trinera

edge of Eleocharis marsh,
locally abundant

35738

Polygonum

locally abundant
in marshy spot.

35739

Pyrosia lanceolata

epiphytic on coconut trees

8

1000

culms erect

stems decumbent,
ascending distally;
flowers white
fronds fleshy.

300

1954 Guam

Jan. 1 - Tutujan, ^{4.5} Agaña

Cultivated

35340

Ruffa

Climbing on fence

41 Hibiscus sabdariffa
in gardenJan 2 - north of Wattergel
junction

cleared ground on limestone

4 42 Crotalaria mucronata var.
small colony near road4 43 Pennisetum
abundantJan. 2 - 2 km inland from
Hilsan Point1 44 Digitaria insularis
rare in open fieldJan. 2. - Tamuning
cultivated in garden1 45 Gaillardia ~~frut.~~ puberula Foug.

1 46 Aster nov-belgii L.

1 47 Malpighia coccigera

1 48 Duranta repens

50 m
130

extensive vine, flowers
bright lemon yellow, fruit
clusters, angled.
herb 1.5 m. tall, much
branched, almost leafless
at this season, hairs
in inflorescence irritating,
calyx in fruit purple-
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
~~erect~~, 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.

- 35749 *Chrysanthemum morifolium* ?
 1
 1 50 *Chrysanthemum morifolium*
 1 51 *Pseuderanthemum bicolor* (Sibth.) Ralbk
 1 52 *Asparagus plumosus*
 1 53 *Coreopsis tinctoria* Nutt. ?
 7 54 *Plumbago auriculata*
 1 55 *Angelonia*
 1 56 *Rosa*

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

~~Terrace~~

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

- 7 57 *Dioscorea*
 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 lobes, 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.

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

Jan. 2 - Tweed's Cave

Napota

limestone cliffs

35359

Ficus prolixa

4

common on bare limestone

4 60

Ficus prolixa

bare limestone

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*, *Papoua*, 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 cliff 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

Ficus prolixa
abundant

Pipturus
abundant

shrub, 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*.

1954 Guam

The forest on the slope up to the plateau is largely Antocarpos, Trifolium, Aglaia, Freziera, Cyas, Morinda, Premna, etc.

Forest on top, where still existing, is largely Antocarpos and Pandanus.

Jan. 7 - Tanning

35761

cultivated in pot in shade

Jan. 3 - top of Mt. Lamlam

decadent moist forest on limestone

63

locally common

64

common

65

Morinda umbellata v. glandulosa
occasional

Jan. 5 - top of flat topped erosion remnant

5 km. east of ~~the~~ bay

66

Andropogon fragilis L. var. ^{yellow}
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 #35760)
shrub 2 m. tall, leaves white beneath, rugose above, vines climbing in Dec.

160

shrub

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 *Freyrinetia torresiana*
- la *Alocasia macrorrhiza*
- c *Piper guahumense*
- c *Nephrolepis bisectula*
- c *Davallia solida*
- c *Polypodium punctatum*
- o *Fagraea berteriana*
- o *Ficus vitorica*
- o *Guamnia marianensis*
- o *Pipturus argentum*
- c *Premna obtusifolia*
- o *Triphasia trifolia*
- o *Claoocarpus joga*
- o *Guettarda speciosa*
- o *Procris pedunculata*
- o *Medinilla rosea*
- o *Psidium guajava*
- ^ *Artocarpus altilis*
- ^ *Pouteria*
- ^ *Leucaena glauca*
- o *Morinda citrifolia*

- r *Marsa*
 In open places, clearings,
 roadsides, etc.
- a *Paspalum conjugatum*
 c *Chloris inflata*
 c *Cenchrus echinatus*
~~*Phyllanthus*~~
 c *Cyncha bonariensis*
 cc *Dryopteris unita* (!?)
 c *Pilea microphylla*
 lc *Phyllanthus marianthensis*
 cc *Miscanthus floridulus* (limestone ledges)
 one clump in open on
 flat and common on
 bare limestone ledges.
- l *Cestrum diurnum*
 r *Hypoxis capitata*
 r *Cynodon dactylon*
 r *Flemingia strobilifera*

In cleared places
Piper guahumense 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 areas.

Jan. 7 Jumbo Long 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 saffordii*
 o *Hypoxis capitata*
 r *Myrtella benigueriana*
 r *Wikstroemia elliptica*
 r *Decaspermum frutescens*

Bare erosion scar:

- c *Alechnum orientale*
 c *Stenoloma*
 o *Phyllanthus saffordii*
 o *Chrysopogon aciculatus*

1954 Guam

Jan. 5 - 2.9 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 clavigera*
- la *Lindaea ensiformis*
- c, la *Myrtella bennigseniana*
- c *Wilstroemia elliptica*
- c *Geniostoma*
- c *Rhynchospora ^{rubra} ~~compensans~~*
- c *Rhynchospora*
(small, open inf.)
- c *Hypis capitata*
- c, la *Melastoma malabathricum*
- c *Chrysopogon occidentalis*
- c *Elephantopus mollis*
- c *Casuarina equisetifolia*
- lc *Dianella*
- o *Phyllanthus seffordii*
- o *Scaevola frutescens*
- o *Morinda 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 *Mitracarpus hirtellus*
- la *Elephantopus mollis*
- c *Dimeria chloridiformis*
- c *Hypis capitata*
- c *Centella asiatica*
- c *Ageratum conyzoides*
- c *Chrysopogon occidentalis*
- c *Lycopodium complanatum*
- c *Scaevola frutescens*
- c *Geniostoma*
- c *Gleichenia linearis*
- o *Casuarina equisetifolia*
(large on edges of steep slope)
- o *Heteropogon contortus*
- o *Wilstroemia elliptica*
- o *Melastoma malabathricum*
- o *Fimbristylis annua*
- o *Scleria* (small) (*multicaulis*)
- o *Cheilanthes tenuifolia*
- o *Glochidion ovatum*

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

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

- (Antocarpus altalis
Pandanus tectorius
Areca cathecu
Ficus prolixa?)

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

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

- c Miscanthus floridulus
 - a Dimeria chloridiformis
 - a Chrysopogon aciculatus
 - la Mitracarpum hirtum
 - a Stachytopheta indica
 - c Scaevola putrescens (on slope)
 - c Gleichenia linearis (on slope)
 - c Claphantopus mollis
 - c Andropogon fragilis?
 - o Hyptis capitata
 - o Casuarina equisetifolia
- (older ones around edge,
a few seedlings flat)

- o Wikstroemia elliptica
- o Waltheria indica
- o Fimbristylis sp.
- o Geniostoma
- o Ligeratum conyzoides
- o Morinda citrifolia (on slope)
- o Curculigo orchioides?
- o Myrtella benigrensis
- o Glochidion marianum

Between these mesitas
there are rather conspicuous
flat or very nearly flat
areas at somewhat lower
elevation. These surfaces
might be mistaken
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 regional 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~~ clay
that ~~weather is~~ 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 windbeaten (up to 21-31 cm. 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 rather resist revegetation. *Polaris* (small) seems to prefer this habitat, and *Pennisetum* and several other grasses and sedges are able to invade it, but more slowly than on bare soil.

Jan. 6 - Mt. 1 km. s.e. of

Jumufong Mangro Mt.

Gently rolling ^{partly} slope
of deeply weathered
volcanic material.

- 35367 *Belagimella ciliaris* (Retz) Lf. vertical banks of large erosion scar, with 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 *Dasyploca maemouensis* edge of patch of woods in ravine.
- 11 72 *Cyathea lunulata* occasional in both heads of ravines in patches of woods.
- 3 73 *Hedyotis megalantha* Merr. common in grassland near edge of woods.
- 5 74 *Oplismenus imbecilis* carpeting ground in edges of patch of woods in ravine.
- 1 75 *Centotheca lappacea* occasional in edge of patch of woods in ravine.
- 5 76 *Antrophyum plantaginifolium* (Thunb.) Kuhn. 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
3 cm. diam. leaves up to
~~1.5 m. long.~~
small shrub up to 1 m.
tall; fls. white.

prostrate.

culm erect

blades arching downward,
leathery.

- 3537.7 *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 *Utricularia pumila* on prairie but
patch around old approaching
installation on summit.
3 mi. north of
Jan. 7 - ~~near~~ 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

- 2-4 leaves fleshy
- medium tree, leaves
and flower aromatic,
flowers pale green.
shrub 2 m. tall,
leaves with a
frothy appearance;
flowers magenta.
- 380 m. tangled decumbent to
ascending culms.
microbarne
- 115 m.
- 1-2 m. tall, from
creeping superficial
rhizomes.
- 195 m.
- caespitose,
stems erect from large
clumps of rosette leaves.
flowers white
- 115 m.

35384 *Operculina*
8 around edges of forest

4 35 *Columbinum asiaticum*
edge of forest

6 36 *Lepturus repens*
along sides of road
and in edges of forest

2 37 *Ipomoea indica*
along roadside

1 38 *Ipomoea indica*
along roadside

6 39 *Claoxylon*
edge of forest

2 90 *Eugenia javanica*
in secondary forest

117m. tremendous vine,
blanketing trees and
shrubs, flowers white,
anthers spirally coiled.

135m. 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~~

1954 Guam

Jan. 7 - Anderson Field

In base nursery, cultivated

35371 *Catalpa longissima*x 92 *Albizia*4 43 *Phaseolus lunatus*x 94 *Pseuderanthemum**caruthense* ^{W. & A.} *caruthense*x 95 *Pseuderanthemum**caruthense* var. *atropurpureum* (Bull.) Fockex 96 *Morus*1 97 *Alpinia* 2

Jan. 7 Yigo

~~are~~ cultivated in garden
of Manuel Cabos1 98 *Zephyranthes candida*
border plant1 99 *Polyscias*35400 *Asparagus sprengeri*
spot plant1 01 *Coffea liberica*

163 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.

179 m.

flowers white.

shrub, 1 m tall,
aromatic.caespitose, stems
arching; flowers white.tree 2 m tall, only 4
years old, fruit green.

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

1 03 *Cupressus*

1 04 *Maranta arundinacea*

1 05 *Moribot glaziovii* n.h

2 06 *Pterocarpus indicus*

07

Jan. 7 Between Wattergel
 Junction and Gigo

1 07 *Triumfetta semitriloba*
 roadside

6000

Jan. 8 Lasa Valley,

1 08 *Lygodium circinatum* v. *semilactatum*
 rare on brushy side of ravine.

12000

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.

12000

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

2000

vine tangled in brush,
 half dead.

Jan. 8 - 3 1/2 miles S. of Agat

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

Chalandao

Jan. 6 - Mountain 1 km S.E. of Jumbofong Mangro (see 3223)

This is a gently sloping rolling relatively level top, grassy except for large brown 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 at upper ends of ravines. (tree layer incl. shrubs)

- a Pandanus tectorius
- ca. *Dioscorea cathartica*
- ca. *Hibiscus tiliaceus*
- c *Ficus prolixa*
- c *Tournefortia*
- c *Geniostoma* (edges)
- c *Cyrtosperma*
- c *Premna obtusifolia*
- o *Mussa* (edges)
- o *Morinda citrifolia*
- o *Melochia*

- o *Polypodium*
- o *Polypodium* *trichomanes*
- o Epiphyte and climber
- c *Freyriasiella* *torresiana*
- o *Medinilla* *rosea*
- o *Rygodium* *ascandens*
- o *Polypodium* *punctatum*
- c *Davallia* *solida*

Herb layer

- c *Nephrolepis* *laevigata*
- c *Heliconia* (large)
- r *Angiopteris* *evecta*
- o *Centotheca* *leppachia*
- la *Oplismenus* *undulatus*
- c *Alocasia* *macrorrhiza*

Some seed patches in
ravines between
patches of forest.

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

Grass communities
on level to rolling areas:
Dimeria *chlorodeiformis*
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
ravine communities.
On slopes, ravine walls,
etc. *Miscanthus* is
dominant and even
exclusive.

Secondary species
here, mostly in both
communities:

- la *Gleichenia* *linearis*
 - la,c *Elephantopus* *mollis*
 - c *Hypoxis* *ceratophora*
 - c *Hedyotis* *megalaantha*
 - c *Malabarica* *malabarica*
 - c *Chrysopogon* *aciculatus*
 - c *Hypis* *capitata*
 - c *Phyllanthus* *saffordii*
 - la,c *Sindsaya* *ensiformis*
 - lc *Mitrasacrum* *hartum*
 - lc *Chilanthus* *tennefolium*
 - lc *Rhynchospora* *corymbosa*
 - lc,o *Centella* *asiatica*
 - lc *Andropogon* *fragilis*
 - o *Glochidion* *cranioides*
 - o *Dianella*
 - r *Wikstroemia* *elliptica*
 - r *Stachytarpheta* *indica*
 - r *Myrtella* *benzoinensis*
 - l *Oplismenus* *undulatus*
 - l *Belagrella* *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 the flat places or in depressions in ~~the~~ level fluffy 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 1st, and Anderson Field and east of Yigo, east of the line of private property - east of Perez property (lot 7090), Blau property, south to the 7100 plot, 7033 plot, and 7092 plot. This is reasonably good woods, and protected on 2 sides by ocean and airport base. Property owners are favourably disposed.

Contains roosting places of fruit bats

Calvo says that in former times the native 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 smoking them several

1944 F

times or separate days
This was apparently
arrived at by observing
behavior of trees around
cook houses, etc. when
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 10 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 mosquito
is very common. Sometimes
smudge fires are built
under houses elevated
on pilings. Pags (*Hibiscus*
tiliaceus) usually used.
An old log 10 feet long
will burn very slowly,
smoking 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, eggs, pinda,
dugdug and yogo. 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" (*Guamnia*) wood
is used for forins handles.
"alumi" (*Melanolepis*) wood
is used for shot larts.

"ladi" (*Mimosa citrifolia*)
wood used for rafters.

Plants cultivated
in Calvo's garden:

Nopala cochinillifera

Delonix regia

Passia americana (common name)

Barleria cristata

Catharanthus roseus
Cochlospermum variegatum
Vanda Miss Jaque
Allamanda cathartica
 var *hendersonii*
Bougainvillea spectabilis
Hibiscus hybrid
Plumeria rubra
Citrus sinensis
Caesalpinia pulcherrima
Averrhoa bilimbi
Quercus canariensis
Xylocarpus caudata
Dioscorea bulbifera
Araucaria excelsa
Herodiasium aureum
Mangifera indica
Canna hybrid
Antigonon leptopus
Diospyros discolor
Epipremnum
Asparagus sprengeri
Asparagus plumbeus
Chamaecyparis
Tabernaemontana divaricata
Dioscorea
Codyline terminalis
Rosa sp.
Cassia javanica
Nerium oleander
Yucca sp.
Cupressus sp.
Coffea liberica
Panicum granatum

Gyneria tenuifolia
Citrus medica (low)
Begonia sp.
Polygonum tuberosum
Xylocarpus caudata
Acalypha emarginata var *retusa*
Caladium bicolor
Hedyotis coronaria
Hedyotis flavum
Psidium guajava
Polycaea frutescens (fruit)
Polypodium scolopendria
Annona squamosa
Conocarpus (sp. aff.)
Curcuma domestica
 (low, fruit)
Alocasia macrorrhiza
Musa paradisiaca
Musa nana
Maranta arundinacea
Carica papaya
Terminalia catappa
Xanthosoma sagittifolium
Monstera deliciosa
Clumbaego ~~sp.~~
Musa ~~sp.~~
Celosia argentea
Annona muricata
Pterocarpus indicus "nani"
Spathoglottis campanulata
Lantana camara
Casuarina equisetifolia
 says that the big 3 dimensional
 olive-green sp. was not
 noted before about 1946.

Jan. 7 - Anderson Airforce
Base nurseries.

Plants observed - mostly
nursery stock:

Hibiscus hybrids.

Phaseolus lunatus

Polyscias frutescens s. *piifolia*

Scaevola aurea

Phyllanthus niruri

Antigonon leptopus

Zinnia elegans

Cassia alata

Tithonia speciosa

Catharanthus roseus

Kalanchoe pinnata

Ruffa angulata

Corchoris sp.?

Caladium bicolor

Flerodendrum speciosum

Polyscias guilfoylei

Spathodea campanulata

Acalypha anandiana s. *arvensis*

Burleso cicutata

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

Brassicaceae sp. (both green and

very much crushed fruit)

Pedilanthus tithymaloides

(both green and

variegated form -

do not flower at

same time)

Saccharum officinarum

Thespesia populnea

Jatropha multifida

Aphyllanthus candida

Canna hybrid

Flemingia strobilifera

Polyscias scolobolus

Jan. 7 - West end 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
scorches, as most of
forest must have been cleared out.

1954 Guam

Jan 3 - Mt. Makye, ridge south of Font P. Examined several sections, especially the transition from structured 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 in a thick, of $\frac{3}{8}$ unconsolidated material, bedding becoming planar and number of large particles greater downward. Red color less pronounced downward, the beds really free from larger fragments (2-10mm), less above. Color may have been washed down from red cap further up hill.

Jan. 3 - Lasa Valley, above Lasa.

Here, a thick layer of rather fine, thin bedded alternating red in color, a bit toward north, the unconformably a

a 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 well preserved seed or small dry fruit.

This material is at least 0.5 m down, yet has many root holes, some even with recognizable remains still in them. These 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 thaxite several lam. s. of Agat.

Here slumping is very prominent because there is some deep gullying.

1954 Guam

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

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

Jan 7 - Road from
Pago Bay to Umatac,
by car.

Around Pago Bay are
Rengans very abundant.
Some Nipa swamp back
of bay.

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

Coastal strip, especially
in south, planted to
Coconuts. Along a part

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

In the f. Coconut
plantations which in the
Merizo region and
eastward, lie on the
sandy coastal strip
fringing the volcanic,
have a vigorous growth
of grasses between them.

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

1954 Guam

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*, 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 cocooned that eats the leaves.

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

with *Artocarpus* (dugong), *Hibiscus* *tibicaria*, *Proelia* (common), and both species of *Pandanus*, *P. dubius* (fruiting) and *P. tectorius* (leaf) with, at least lower down, some *Arceuthobium*. Coconuts common on lower slopes, also breadfruit (edible), and *Cycas*.

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

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

Information from
Joe Santiago:

Patel out.

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

1954 Guam

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

The axillary buds of both turn red at maturity. They are chewed when green, red, or dry or saprotic. Preferred when red. A gunny sack full brings \$1.50 in the market. (I had specimens in red, as I showed them to you)

Allocasia macrorhiza

= "papaia"
inedible

Allocasia sp.

= "piga" edible

Colocasia esculenta - "papaia"
because it bours before the wind or when stepped on and is sweet again next day. (Only purple stemmed form seen.)

Xanthosoma - "papaia", tub.

Adiantum *versatile*,
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" (root) is used in food.

Curcuma sp.

"Mango galuntana"
is sold with root bracts.

Breadfruit season is April to August with some till October.

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

ycas curranii (Federico)
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 person, 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"

Leucaena = "nanasi"

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

The ~~the~~ mountains
south of Jumulang Mangla
are, in order, Chalandao,
Chalan Palii, Nala,
Polanos, & Schroeder.

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

mostly dead at the
tops and sprouting
vigorously from the
lower parts, 3-4m tall.
~~It is often in a row~~
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*
(tree to 15m high)
- c *Sporobolus sp. capricorn*
- c *Vernonia cinerea*
- c *Cenchrus glaucus* (small
seedlings only)
- lc *Pandanus tectorius*
- lc *Stachytarpheta indica*
- lc *Comp.*
- c *Ageratum conyzoides*
- c ~~the~~ *Combretum* *hirsutum*
- c *Panicum*
- lc *Vigna marina*
- lc *Hedyotis albida-punctata*
- lc *Clodendrum inornatum*

On the cliffs above

1954 Guam

are

- a *Triphasia trifolia*
- la *Calceana glauca*
- c *Casuarina equisetifolia*
- c *Cassytha filiformis*
- lc *Vernonia cinerea*
- lc *Ageratum conyzoides*
- l *Peuceleia frutescens*
- l *Passiflora foetida*
- o *Pisonia obtusifolia*
- u *Miscanthus floridulus*
- n *Cyrtosperma integrifolium*
- n *Carica papaya*

Jan 10 - Umatac, on
~~camp~~ water point,
 base of cliff at head
 of valley

Disturbed wooded ground

33

75411

4

~~Guam~~ *Cratogeomys* *rapidus*
 common along roadside
 in bare ground.

- 6 12 Paper beetle
 climbing on tree, common

Jan 10 - Umatac
 along strand, above
 high water

4

13

local but few spec colony

100 m.

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

1 m.

flowers lavender.

55414 *Panicum*

6

common on beach and lower part of cliff

15 *Hedyotis albida* - punctata on rocks at top of beach16 *Phyllanthus wingatus* Forst. f. among rocks17 *Phyllanthus* ^{among Schum. & Th.} ~~amaryllifolius~~ ^{1855 G. L. White} common among rocks

same - along road

18 *Panicum*

near cement wall

19 *Abutilon*

around culvert where stream goes under road

Jan. 11 - Umatac - along strand above high water

20 *Hymenocallis littoralis* most abundant around fresh water seeps, top of beach.21 *Lantana camara* L.

one plant in thicket at top of beach near old house

22 *Lepturus repens* var. *sobolatus* Forst. f. at top of beach and on rock ledges just above.23 *Digitaria*

at top of beach

24 *Hypis capitata* Jacq.

at foot of cliffs, in slumped earth.

small tufts, strongly spreading.

(H. W. S.) Forst. plant depressed, spreading; leaves not fleshy, leaves closing near midrib.

1855 erect herb, leaves glaucous beneath.

1-3 m. erect to prostrate

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

1-2 m.

peduncle compressed, flowers white.

shrub 1 m. tall; flowers bright yellow.

forming loose mat from primary tufts

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

35475 *Amaranthus viridis*
 on beach around strain
 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 haphazard,
 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*,
~~the top~~ *Ipomoea pes-caprae*, and a
 shrub of *Diosmodium*
umbellatum, trees of
Casuarina equisetifolia,
Hernandia sonora, and
Sesuvium portulacastrum. At
 the top of the beach wall
 is *Hymenocallis littoralis*
 especially around
 fresh water seeps.

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

On the cliffs is a
 dense scrub, principally
Triphasia tribolis, but
 with *Scaevola*, *Miconia*,
Pandanus, *Prunus* and
Rauvolfia locally important,
 and with scattered
Casuarina trees. Herbs
 are *Polypodium scolopendria*,
Vernonia cinerea, *Lygodium*
lancofolata, *Hypoxis*
pectinata, *H. capitata*,
Ageratum conyzoides,
Peperomia pinnatifida,
 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 ridge.

(1) Graded slope of dark
brown soil.

- a. *Dimeria chloroidiformis*
- a. *Waltheria indica*
- c/a. *Stachytarpheta indica*
- c. *Heteropogon contortus*
- c. *Rhynchospora corymbosa*
- c. *Cantharospermum acutiserratum*
- c. *Hypis suaveolens*
- c. *Hypis capitata*
- c. *Cassytha filiformis*
- c. *Fimbristylis* sp.
- c. *Fimbristylis* sp.
- c. *Chrysopogon aciculatus*
- c. *Miscanthus floridulus*
- c. *Mitrasacrum bistrum*
- c. *Centella asiatica*
- lc. *Phyllanthus virgatus*
- o. *Phyllanthus saffordii*
- o. *Andropogon fragilis*
- o. *Chenanthus tenuifolius*

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

- a. *Chenanthus tenuifolius*
- a. *Paspalum contortifolium*

(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 chloroidiformis*
- c. *Rhynchospora corymbosa*
- lc. *Curculigo orchivola*
- lc. *Dianella*
- lc. *Pandanus tectorius*
- lc. *Andropogon fragilis*
- lc. *Stachytarpheta indica*
- lc. *Hypis suaveolens*
- lc. *Chrysopogon aciculatus*
- lc. *Phyllanthus virgatus*
- lc. *Pennisetum ensiforme*
- o. *Heteriscomia* (?)
- st. *Eugenia bryanii*?
- o. *Stenandrium frutescens*
- l. *Fimbristylis* sp.
- o. *Fimbristylis* sp.
- o. *Rhynchospora rubra*?
- o. *Morinda citrifolia*
- o. *Timonius*
- o. *Fimbristylis cynosuroides*
- o. *Triphasia trifolia*
- o. *Phyllanthus saffordii*
- o. *Emilia javanica*

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

- a Hyptis suaveolens
 a Chrysopogon aciculatus
 a Waltheria indica
 a Phynchospora 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
 r Cheilanthes tenuifolia
 r Paspalum abscissum
 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, c Mitrasacrum birtum

- e Phyllanthus saffordii
 c Dimeria chloridiformis
 c Waltheria indica
 c Emilia javanica (round or long)
 c Phynchospora corymbosa
 c Centella asiatica
 c Cassytha filiformis
 lc Wikstroemia elliptica
 lc Triphasia trifolia
 lc Curatella orbicularis
 o Scaevola frutescens
 o Melastoma malibathium
 o Hyptis capitata
 o Hyptis suaveolens
 o Pandanus tectorius
 o Stachytarpheta indica
 o Lindsaya ensiformis
 o ~~St~~ Vernonia cinerea
 r Glossogyne tenuifolia
 r Glochidion marianum
 r Lygodium scandens
 r Casuarina equisetifolia
 r Psidium guajava
 r Decaspermum frutescens

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, *Mitrasacrum birtum*

Jan. 11 south to southeast of Umatac

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 aurea* var.
 common in eroded grassland
- 5 30 *Wikstroemia elliptica*
 occasional on eroded volcanic breccia
- 3 31 *Eugenia bryanii*?
 common on eroded knolls
- 7 32 *Andropogon fragilis*
 common on eroded ground

- lc, r *Stenoloma*
 o *Casuarina equisetifolia*
 o *Pandanus tectorius*
 o *Scaevola frutescens*
 o *Phyllanthus saffordii*
 c *Sorrelia javanica*
 2 *Hedyotis laurina*
 r *Sporosa littoralis*
 r *Glochidion marianum*
 r *Myrtella benpigeanum*
 r *Wikstroemia elliptica*
 r *Fimbristylis aurea*?
 r *Blechnum orientale*
 r *Stachytarpheta indica*
 r *Cheilanthes thomifolia*

37-1114

caespitose

scarcely caespitose

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

- 35433 *Curatella orchivoides*
common locally in grassland
- 5 34 *Fimbristylis schauderiana* var. *foliosa* (Kuhn) F. & S.
common locally in grassland
- 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 *Sponsoea littoralis*
rare in grassland
- 40 *Emilia farinosa* (Pursh) Polak
Jan. 11 - s. e. of Umatac,
about 1 km.
densely wooded ravine
- 1 41 *Rioscorea*
local in woods
- 5 42 *Belvisia*
epiphytic on tree trunks
- 6 43 *Balanophora*
common, parasitic on
a. s. *Triphasia trifolia* roots
b. s.

80-100m

flower bright yellow.

) F. & S.

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 epiphytic
roots and vine are
connected. Vines mostly dead,
margins wavy.bright pink bracts and
sterile flowers, pedicels
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 (Nasturium)
- o *Freyzinetia torresiana*
- o *Hibiscus tiliaceus*
- o *Geniostoma*
- o *Timonius*

- 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 wiled 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.

1954 Guam

- 35444 *Arca cathen*
 2 large grove in valley
 bottom.

~~Atorpa~~

Jan 12 - Merizo Annex
Pandanus savanna

- 1 45
 rare in weedy grassland

Jan. 12 - Umatac

- 2 46 *Adonidia merrilliana*
 cultivated along streets.

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

41 m. tree 4 m. tall; sheath of
 leaf closed, pinnate
 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.

41 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 slope on all sides and the valleys of ~~the~~ Halayuan and Fanaihung, stretching down toward Umatac and Marigo 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 *Panicum*.

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

- c *Waltheria indica*
- c *Erulia javanica*
- c *Heteropogon contortus*
- c *Fimbristylis acinus*
- c *Pandanus tectorius*
- lc *Glossogyne tenuifolia*
- lc *Phyllanthus saffordii*
- c *Vernonia cinerea*
- c *Euphorbia hirta*
- c *Mitracarpum burtoni*
- c *Cassytha filiformis*
- lc *Chrysopogon sciadatus*
- lc *Centella asiatica*
- lc *Isaevola frutescens*
- c *Ischaemum triflorum*
- c *Glochidion marianum*
- c *Paspalum obtusum*
- c *Fimbristylis*
- c *Hyptis suaveolens*
- c *Cheilanthes tenuifolia*
- c *Ternstroemia*
- c *Psidium guajava*
- c *Phyllanthus virgatus*
- c *noted*

That the *Miscanthus* is so invader seems evident from the lack of beached stubs 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 *Dimeris chloridiformis* and *Rhynchospora corymbosa*, about equal, conspicuously tufted, exposing about 2/3 bare soil.

- a *Dimeris chloridiformis*
- a *Rhynchospora corymbosa*
- a *Chrysopogon aciculatus*
- la *Hypochaeris 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 *Hypochaeris suaveolens*
- o *Fimbristylis*
- r *Sporobolus littoralis*
- r *Euphorbia*
- r *Vernonia cinerea*
- r *Cheilanthes tenuifolia*

- Black lava(?) knob - old as lava, much eroded and weathered, recently burned over.
- a *Heteropogon contortus*
 - lc *Stachytarpheta indica*
 - c *Pandanus tectorius*
 - c *Waltheria indica*
 - c *Diarrhiza*
 - c *Eugenia bryanii*
 - c *Scaevola frutescens*
 - c *Phyllanthus saffordii*
 - c *Fimbristylis cymosa*
 - c *Elephantopus mollis*
 - c *Miscanthus floridulus*
 - lc *Glossogyne tenuifolia*
 - lc *Hypochaeris capitata*
 - o *Hypochaeris suaveolens*
 - o *Andropogon fragilis*
 - o *Dimeris chloridiformis*
 - o *Fimbristylis*
 - o *Wikstroemia*
 - o *Cassipouita foliiformis*
 - o *Dodonaea viscosa*
 - o *Triplaris trifolia*
 - o *Scleria ovalis*
 - o *Fimbristylis annua*
 - l *Andropogon ensiformis*
 - l *Conium javanicum*
 - l *Centella asiatica*
 - r *Casuarina equisetifolia*
 - r *Glochidion varianum*
 - r *Cerbera dilatata*
 - r *Euphorbia*

1974 Guam

- *Decaspermum frutescens*
- *Tacca leontopetaloides*
- *Paspalum abricariae*
- *Mitrasacme hirtum*
- *Ternstroemia*

J. E. Guinata, a companion
of Umatas, gave me the
following information

Pimenta chloridifera =
Chaguas moroc
(eaten by cattle)

Lycopodium cominum =
Painea julitae
the legend is com.

Fragaria tomentosa =
fairots (Cocoputan
shrub)

Tacca leontopetaloides =
gabgab (grated
and starch, cooked
out, used for bread)

Jan 13 - Road between
Merizo and Inarajan

35447 *Sporobolus*
weedy roadside thicket

Jan

climbing over bushes,
flowers dull pink-purple.

1954 Guam

Jan. 13 - Martinez Pasture
Dan Dan

Vast flattish basin, draining eventually into Talofofs 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*, *Dimeris*, 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 - Mataquac
Spring, so 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 evecta* are ~~very~~ common, along with other ferns, such as *Nephrolepis hirsutula*, *Tectaria crenata*, *Dryopteris indivisa?*, and *Pavellia solida*. *Antocarpus*, *Pandanus dubius*, *P. tectarius*, *Glaucoarpus* spp., *Hibiscus tiliaceus* and *Morinda citrifolia* make up ~~the~~ broad leaved thickets in addition to the bamboos. *Cecropia* and *Ipomoea* are common. Mosquitoes unbelievably vicious.

Jan. 16 - Forest around Pago Bay is nearly all *Leucaena glauca*. This extends abundantly to Ylig Bay. There 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 Talofofo River, about 300 m. above mouth.

Mud flats at water's edge, recently flooded.

- 35443 *Heliotropium indicum* L.
abundant on flat in bog pasture
- 49 *Malvastrum coromandelianum*
on large limestone boulder fallen from cliff, out flat
- 50 *Hedyotis biflora*
occasional on mud flat
- 51 *Mollugo*
rare on mud flat
- 52 *Torenia*
rare on mud flat
- 53 *Torenia*
rare on mud flat
- 54 *Ceratopteris gaudichaudii*
on mud at edge of water

0 m

erect, most plants large, 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 flowers seen.

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

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

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

Composition

- a *Pandanus tectorius*
- a *Hibiscus tiliaceus*
- a *Triphasia trifolia*
- c *Clodendrum inerme*
- c *Glochidion nanum*
- c *Freycinetia torresiana*
- c *Discozalysa*
- pc *Pandanus dubius*
- o *Cycas circinalis*
- o *Cassytha filiformis*
- o *Pithecellobium dulce*
- o *Flagellaria indica*

- 45455 *Dryopteris*
common on floor of forest
- 9
- 3 46 *Scleria*
common in edges of forest

100 m.

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

*rhizome prostrate, slightly
erect.*

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 karika*. *Aves cathartica* is occasional. *Eleocharis inermis* is locally abundant, as is *Cerostichum aureum*. Patches of a large *Rhynchospora* climbing in trees, occasional.

35457

Rhynchospora

dense patch in mud - broken swamp forest.

same - small emergence at edge of swamp.

35458

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

2

58

Heteropogon

common on ~~low~~ low hill

2

59

Orchid

epiphytic

feathered coronas in some places abundant. *Canavalia* very common around edges.

2-3 m

caulome weakly erect leaves sharp-edged

50 m

tree 15 m tall, 6 dm thick; sterile.

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

35460

rubid

1

epiphytic

1 61

~~Hemipit~~

epiphytic

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

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

same - on rough limestone outcrop - Macamog formation. Thicket forest on rough, deeply pitted, broken karrenfield 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

50-110

conspicuous
caespitose; buds white.

- c Cordia subcordata
- c Aglaia mariannensis
- c Guettarda speciosa
- c Blechnum mariannensis
- c Guarea mariannensis
- c Freycinetia torresiana
- c Phyllanthus mariannensis
- c Flagellaria indica
- lc Casrytha filiformis
- o Intsia biguaya
- o Pontederia
- o Eugenia seawardiana
- o Psychotria mariana
- o Pogonochloa lanceolata
- o Piper guahamense
- o Allophylus sp.
- o Cycas circinalis
- o Polypodium punctatum
- o Ipomoea indica
- o Scaevola frutescens (edge)
- o Morinda citrifolia
- o Morinda umbellata
- o Maytenus thompsonii
- o Cladocylon
- o Melanolepis multiglandulosa
- o Antocarpus altilis (dry dry)
- o Macaranga
- o Nephrolepis hirsutula
- o Calaca papaya
- o Premna obtusifolia

o fernium 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, seaweeds
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.

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

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

in very bad shape,
with upper branches
dead and bunches
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
(Lasaquada Point)

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

Composition (woody plants)

- c *Ficus prolixa*
- c ~~Ch~~ *Ochrocephalus odoratus*
- c *Ochrocephalus oppositifolius*
- c *Macaranga*
- c *Guamnia marianensis*
- c *Morinda citrifolia*
- c *Cestrum drummondii* (edges)
- o *Aplasia marianensis*
- o *Psychotria mariana*
- o *Pouteria*
- o *Cynometra ramiflora*
- o *Pisonia grandis*
- o *Pipturus argenteus*
- o *Premna obtusifolia*
- o *Hibiscus tiliaceus*
- o *Phyllanthus varianus*
- o *Melanolepis multiglandulosa*
- o *Eugenia sunawathana*
- o *Triphasia trifolia*
- o *Cyperus cirinalis*
- o *Guettarda speciosa*
- o *Boutisia 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, "clearfield"
surface, ~~to~~ the edge
at 7-10 m. above sea level.
Below is an excellent
development of the
so-called "worm-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 platanus*
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*
albido-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 (Larraguana) Point,
in low vegetation on
deeply pitted limestone
near edge of terrace
above sea.

35463 *Canavalia* ~~septica~~ (Sw.) DC
occasional at edge of scrub

64 *Phyllanthus marianus* M. A.

in pitted limestone in very low vegetation near edge of cliff.

This is varied by patches of
Ipomoea per-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 angata
Pandanus dubius
Pandanus tectorius
Hibiscus tiliaceus
Clerodendrum inerme
Achroia oppositifolia
Achrocarpa odorata
Ipomoea tuba
Vigna marina

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

10m

sterile vine climbing
over low vegetation

uppressed shrub, leaves mostly
vertically, some

- 35465 *Ischaemum?*
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
- 7 73 *Wedelia biflora* var. *caneyana*
abundant on terrace back
from edge of limestone cliff

Jan 17 - just north of
Campahaya (Tasonggut) Pit

- 5 74 *Asplenium*
on rocks at mouth of spring
- 5 75 *Indigofera suffruticosa* Mill.
common on roadside
on slope

- 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

2000

500

shrub 1 m tall.

Jan. 18 - one mi. s. of Tagueas,
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

9 80 *Geniostoma micranthum* var. *holferi* (G. & B.) Fob.
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

11 m.

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,
flowers 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
- c *Pandanus tectorius*
 - c *Morinda citrifolia*
 - c *Premna obtusifolia*
 - c *Flagellaria indica*
 - c *Capsicum*
 - lc *Piper guahamense*
 - o *Achrosia oppositifolia*
 - o *Cestrum diurnum*
 - o *Triphasia trifolia*
 - o *Guamia marianensis*
 - o *Aglaia marianensis*
 - o *Melanolepis multiflorula*
 - o *Carica papaya*
 - r *Maytenus*
 - r *Taraxacum*
 - r *Discocalyx*
 - r *Claoxylon*
- herbs
- a *Nephrolepis hirsutula*
 - la *Dryopteris*
 - c *Davallia solida*
 - c *Ipomoea indica*
 - c *Peperomia ~~longifolia~~ spicata*
 - c *Vittaria elongata*
 - o *Pyrosia lanceolata*
 - o *Polypodium punctatum*
 - o *Nephrolepis acutifolia*
 - o 6 species of *relids*.

Jan. 18 - 1-1.5 km. s.e. of
Agago Guemar, center of
north plateau.
Thick forest, appearing
rather secondary,
dominated by ~~Pandanus~~,
~~with several~~ *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* (danglang)
 - c *Achrosia oppositifolia*
 - c *Premna obtusifolia*
 - c *Hibiscus tiliaceus*
 - c *Aglaia marianensis*
 - c *Maytenus*
 - c *Elaeocarpus foja*
 - 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 *Marsippospermum thompsonii*
- herbs
- la *Nephrolepis hirsutula*
(terrestrial)

1954 Guam

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

Jan. 13 ^{1-1.5 km. s.e. of} Agaña Guam,
 thick forest

- 35496 *Antrophyum reticulatum*
 epiphytic
 77 *Paspalum conjugatum* ?
 in clearing, in topsoil
 88 *Dischidia puberula*
 common festooning
 tree trunks
 89 *Grasscephalum cepidioides*
 common in clearing

Jan. 19 Asan
 roadside thicket on limestone

- 90 *Gliricidia sepium*
 local colony

175 m.

spreading clumps

leaves thick, soft milky,
 flowers scarce, yellowish.

flowers brick red.

5 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

92 *Aglaia mariannensis*
common tree

15

93 *Isora triantha*

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

5

94 *Cordia thyrsiflora*

rare in low woods

7

95 *Artocarpus ~~strobilifer~~*

common tree in woods
on limestone

5

96 *Pteris*

common on bare limestone
along road.

~~*Morinda pteridifolia*~~

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

283 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
pale toward base.

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

spreading tree 1.5 m. tall;
sap milky; sterile

263 m.

twining vine, climbing
in trees; bark white.

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

35499

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

5

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

35500

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

v 01

rare in grassy spots

6

01 *Thaumatococcus jamaicensis*
 one small colony seen

5

03 *Melastoma malabathricum*
 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
~~erect~~ caespitose,
 culms ascending.

112 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 *Cyperus cirsioides*c *Cananga odorata*c *Freylinia torresiana*c *Zephania trifolia*c *Flagellaria indica*c *Morinda citrifolia*c *Timonius*c *Cestrum diurnum*

patches of Pandanus dubius

- a Pandanus dubius
- c Pandanus tectorius
- c Cycas circinalis
- c Triphasia trifolia
- c Freziera torresiana
- o Morinda citrifolia
- o Claoxylon marianum
- o Premna obtusifolia
- o Piper guahamense
- o Aglaia mariannensis
- o Phyllanthus marianus
- 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, l Pandanus tectorius
- c Macaranga thompsonii
- c Ficus prolixa
- c Pipturus argenteus
- c Triphasia trifolia
- c Cycas circinalis
- o Choringtonia aristata
- o Artocarpus altilis (breadfruit)
- o Centium diurnum
- o Aglaia mariannensis
- o Melanolepis multiglandulosa
- o Areca cathecu

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

- Intsia bijuga
- Hibiscus tiliaceus
- Occhrosia oppositifolia
- Bambusa vulgaris
- Triphasia trifolia
- Annona muricata
- Premna obtusifolia
- Artocarpus altilis
- Melanolepis multiglandulosa
- Ficus prolixa
- Scaevola frutescens
- Macaranga thompsonii
- Claoxylon marianum
- Guernia mariannensis
- Annona reticulata
- Carica papaya
- Pipturus argenteus
- Elaeocarpus jays
- Melochia bursiteria
- Pouteria
- Centium diurnum
- Muntingia calabura
- Areca cathecu
- Allophyllus
- Guettarda speciosa
- Piper guahamense
- Premna obtusifolia
- Ficus tinctoria
- Isora triantha (common on slope)
- Psychotria malaspinae (only seen on w. slope)

Jan. 20 - Turnon Beach

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
~~stand~~ 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 polystachyon
 lb Eleocharis brownii
 c Elephantopus spicatus
 c Ipomoea indica
 c Lida rhombifolia
 c Lida acuta
 lc Triumfetta semitriloba
 o Pithecellobium dulce
 (and a few large ones, obviously
not cleared in 1946)
 o Eragrostis amabilis
 o Morinda citrifolia
 o Canavalia maritima

- o Passiflora foetida
 o Cerebra echinata
 o Clerodendrum inermis
 o Polypodium scolopendria
 la o Kalanchoe pinnata
 lb o Triphasia trifolia
 o Phyllanthus marianus
 l Sporobolus elongatus
 l Centella asiatica
 l Ipomoea per-capra
 (just near beach)
 la Leucaena frutescens
 (just near beach)
 r Antocarpus altalis
 r Cassytha filiformis
 r Ximenes americana

One patch of Leucaena
has tops dead. The twigs,
to about 15 mm diam, had
their bark removed.
Firming suggests that
Astralinia is responsible.

Following observed in dense
shade: a Leucaena (seedlings)
 a Oplismenus compositus
 o Lida acuta
 o Kalanchoe pinnata
 o Polypodium scolopendria
 c Corchorus (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. 30

abundant along roadside
on crushed coral limestone

06 *Bidens pilosa* var. *radiata*

occasional along roadside
on crushed coral limestone.

07 *Caesalpinia major* (Medic) 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 vines;
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 - Anas, e.n.e. of
Mt. Santa Rosa

- 35513 *Euphorbia tinianensis* Hook.
low terrace of deeply
pitted limestone
- 4 14 *Blechnia mainanensis*
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

~~18~~

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

~~19 *Piper*~~
~~thick forest on rough limestone~~

- 5 19 *Pseudomorus brunonianus*
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-pot" medicinal.
- 140 m. body yellowish,
inflorescence and
bracts dull rose pink.
- 160 m. tree 6 m. tall spreading,
with many aerial
roots. "mumu"

160 m.

shrub 4 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 *Guamnia marianensis*
common
- 6 24 *Randia coccinellinensis*
rare
- 7 25 *Alyxia*
occasional
- 2 26 *Raportea latifolia*
occasional
- 3 17 *Ipomoea triantha*
rare
- 21 29 *Guamnia*
rare
- 3 28 *Eugenia*
rare
- 4 30 *Mucuna gigantea*
rare

- sterile vine, clinging
to trunk by roots; ~~leaves~~
leaves fleshy. "pot pupu"
tree 10 m. tall, 12 cm.
thick, sterile.
- 160^m small tree 8 m. tall;
leaves dark green,
subglossy, ripe fruit
red, fleshy. "paipai"
wood used for pine
handles and rafters.
- small tree 6-8 m. tall,
fruit immature. "sami".
Tangled vine climbing
tree trunk, sap milky;
fruit immature
"lederan"
- sterile small tree
"katek palawan" bark
said to ~~sting~~ irritate skin
when dry.
- slender small tree 5
m. tall, sterile "paquabot"
- 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 *Sporobolus indica* (Burm.) Moench
 6 one colony seen in roadside thicket
 5 32 *Vitex*
 planted along road
 2 33 *Aleurites moluccana*
 planted, rare
 4 34 *Aleurites moluccana*
 planted, rare

- Jan. 27 Talofofs Village
 35 *Thunbergia*
 cultivated

- Jan 23 - 1.5 km. s.w. of
 Talofofs Village
 1 36 *Miscanthus floridulus*
 open savanna with tall dense grass, on deeply weathered volcanic rock

- Jan 27 - Maagas River,
 Talofofs System, 1.5 km
 w. of Talofofs Village
 7 37 *Hexandra luykiantha*?
 on low silty natural levee, uncommon

- 179 m.
 twines, flowers white
 "fofga"
 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.

- 30 m.
 vine climbing over
 house, flowers white,
 in pendant racemes.

- 125 m.
 shrub 2 m. tall.
 (sample taken for
 analysis for silica)

- 15 m.
 sterile tree 6 m. tall,
 spreading "monst"

Jan. 25 - Fanagahan Toro.

Thick low forest on brown soil.

- 35538 *Discocalyx*
 3 common in shade undergrowth
- 2 39 *Balanophora* ~~negunda~~
 common, parasitic on roots of *Triphasia*.
- 1 40 *Balanophora* ~~negunda~~
 same

This forest is scrubby, 2-5 m. tall, with a few coconut trees and occasional other trees extending above the rather complete canopy. The canopy is mostly *Triphasia*, the trees 2-6 cm. diam. There are no ferns. Ground is a dark brown soil, pH 4, loose at surface, in shot-like pellets with a few earthworms?

Composition:

- a *Triphasia*
 c *Cocos nucifera*
 c *Hibiscus tiliaceus*
 c *Premna obtusifolia*
 c *Morinda citrifolia*
 c *Pandanus tectorius*
 c *Areca cathartica*
 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* (Chalotshi)
 lc *Pandanus dubius*
 o *Cycas cirinalis*
 r *Jacquinia scabra*
 r *Piper guatemalense*

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. 185 - for cont.

Jan. 24 - Campanaya
Point

35541

3

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

42

Fleurbaeya ruderalis
dissected and fitted
limestone terrace
just above ~~the~~
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 Cyces circinalis
- c Ochrosia oppositifolia
- c Miconia citrifolia

20 m

seems obvious that the presence of the other leaves
in the summit makes the reaction sufficient
to permit complete decomposition, perhaps
also permits earthworms to exist in abundance.

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

- c Guarea 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 Guarea marianensis
- a Triphasia trifolia
- a Cyces circinalis
- c Pandanus tectorius
- c Aglaia marianensis
- c Ochrosia oppositifolia
- c Miconia citrifolia

There is very little burrow
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)

Jan. 24 - Tamuning
 35543 *Passiflora* ^{Bambusa/multiplex}
 2 (Lam.) Razvozh.
 cultivated as ornamental

Jan. 25 - Yoña
 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 orchivoides*
 common

1 47 *Belagimella*
 very local on vertical
 surface of fine ~~to~~ grained
 cherty limestone.

4 48 *Allophylus*
 very local

4 49 *Callicepa candidans*
 local

3 50 *Conitia sonchifolia*
 common

1 51 *Phyllanthus saffordii*
 occasional

15 m
 det. M. Chase
 caves slender, about
 1 cm. thick, growing in
 a close clump, 2.5 m. tall.

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

1.10 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

1 53 *Cantharopogon* / *scaberrimus*
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 on 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 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 cardiana
Glossogyne tenuifolia
Elephantopus mollis
Asclepias curassavica
Pedicularis biflora
Hypocherella nodiflora
Euphorbia hirta
Mitracarpum hirtum
Cassia sp.
Lida acuta
Psidium guajava
Centella asiatica
Waltheria indica
Hyptis capitata
Centrosepium scandens
Curatella orchoides.

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
Dimeris 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 near
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 Saquas,
n. of base of Orote Peninsula
marsh with standing
water.

- 35559 *Cyperus polystachyus* Rottb.
4 dominant over much of
marsh.
- 3 60 *Cyperus polystachyus* Rottb.
occasional in edges
of marsh, in soft mud
- 3 61 *Chara zeylanica*
abundant in open
water
- 4 62 *Bacopa monnina*
abundant in open
part of marsh or mud
- 54 63 *Rhynchospora*
common in open ^{water} part
of marsh
- 3 64 *Paspalum*
common in open part
of marsh.
- 7 65 *Cassia*
occasional in mangroves
at edge of marsh

Large pond or 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

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 climbing
in trees.

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

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 *Eleocharis*
rare on bare ground
- 1 69 *Cyperus polytrichus* Rottb.
rare on bare ground
- 3 70 *Glochidion*
occasional at edge
of mangrove in brushy
thicket.
- 4 71 *Sumnitiera coccinea*
rare in mangrove swamp
- 4 72 *Rhizophora apiculata* Bl.
dominant in mangrove swamp
- 7 73 *Eleocharis*
rare in grassy wet
area at edge of mangrove
swamp.
- 5 74 *Avicennia*
common in sparse
mangroves on firm
calcareous silt.
- 5 75 *Canavallia*
~~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 spine-shaped, with
arching aerial roots.
stems compressed.

trees up to 5 m tall.
mostly sterile (one flower
seen, this 4 parted, yellow).
seedlings abundant.
~~Prostrata, slender, erect,
leaves erect; flowers
use fruit.~~

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

35575 *Canavalia rosea* (Sw) DC
common in open grassland

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
marshes.

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 low plants are

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

dense growth,
from rhizome.

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 *Canavalia*
along the inner margin,
with *Leucaena* outward,
some *Sibiceras tibiacens*
and *Thespesia* mixed in.
In open places on the
sand and gravel is
some *Sporobolus per-capitatus*
and *Canavalia*.

Jan. 26 - Orote Peninsula,
central upland
35580 *Baccharum spontaneum*
common locally
in open dry limestone.

Jan. 27 - Agaña
81 *Chrysophyllum cainito*
cultivated

Jan 27 - Fonte (Com Merianos)
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

sams - in bushy thicket

89 *Jatropha curcas* L.

90 Citrus

75 m.

culms erect, in
clumps, 2-2.5 tall.

2 m.

sterile spreading tree
5 m. tall.

150-9.

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

tuffo shrub - 1 m. tall,
flowers bright yellow.
spreading large
herb, flowers yellow.

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

700 m.

shrub 3 m. tall, flowers
pale green, fruit immatures.
small dark green tree, fruits
ground yellow, aromatic, very common.

Jan. 27 - Mangroves

abandoned nursery site

- 35591 *Coccolobis uvifera*
 92 *Cordia sebestena*
 in shade
 93 *Cinnamomum camphora*
 94
 95 *Vitex trifolia*
 96 *Bixa orellana*
 97
 same - roadside
 98 *Eucalyptus*
 same - experiment station
 99 *Mouroua blakeana*
 cultivated
 same - around dwellings
 35600 *Clodendron siphonanthum*
 growing up through hedge
 01 *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!
 shrub 3 m. tall, sterile.

tree 12 m tall, aromatic.

shrub, flowers 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*
cultivated
4
- 03 *Bauhinia monandra*
cultivated
- 04 *Tabernaemontana divaricata*
- 4 05 *Sporosa erecta* ^{occasionally (South) Rob.}
spontaneous in vacant lot.
- 1 06 *Duranta repens*
cultivated
- 2 07 *Schinus molle*
cultivated
- 3 08 *Phyllanthus acidus*
cultivated
- 3 09 *Bauhinia*
cultivated
- 3 10 *Acacia confusa*
cultivated
- 1 11 *Aphelandra?*
cultivated
- 1 12 *Grevillea robusta*
cultivated
- 1 13 *Miscanthus floridulus*
patch in field back of house / no name associated / spec

- 65m shrub 2 m. tall; leaves green and white; flowers deep dull magenta, laterally compressed.
- tall shrub, sprawling over home roof; flowers pink with red blot 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 buds 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
- 35619 *Jasminum pubescens*
- 1 15 *Plumeria rubra*
- 3 16 *Polyscias frutescens*
- 1 17 *Cactus*
- 1 18 *Sporobolus guamensis*
- 1 19 ~~?~~
- 1 20 *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 *Lancestris*
in pots

- shrub, 1 m. tall, flower
white, fragrant.
fruiting freely.
- shrub 1.5 m. tall.
stem spiral, 1 m. tall
flowers red.
leaves veined with white.
weed in pots; flower
pale lavender.
- leaves terete, mottled
leaves fleshy, flattened
tree shrub 1 m. tall,
branch systems erect.
shrub, flowers
scarlet.
leaves purple beneath,
green above with
sharp white and pink
lines.
- vines, sterile; pubescent
bright purple.
- shrub 2 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

- 1 33 Dieffenbachia
 2 34 Polyscias
 1 35 Polyscias tricochleatus
 1 36 Thuja
 2 37 Polyscias
 1 38 Euphorbia pulcherrima
 2 39 Guaiacum officinale
 1 40 Polyscias frutescens
 2 41 Phyllodendron
 1 42 Chrysophyllum carmitis

same - old nursery site

- 2 43 Thunbergia grandiflora

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

- 1 45 Jan. 28 - ^{east} west of Harmonfield
 Pennisetum purpureum
 abundant locally on
 cleared coral soil

124

- ~~erect~~ erect shrub;
 leaves variegated
 with dull gray.
 erect shrub; leaves
 green with white spots,
 shrub up to 2 m tall,
 leaves extremely crisp.
 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.

vine climbing over
 tree; flowers blue-
 lavender.

260 m.

flowers white.

51 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 *Bibicus tiliaceus*, tangled with *Cecropium* *inermis* and *Derris trifoliata*. Small patches and admixtures of *Phragmites*.

35645a *Burquina 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 *Panicum per-...*

0m small tree 3-4 m tall, calyx red. "mangle" wood said to be used for making rafts or temporary houses.

50m

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

1954 Guam

Composition

- a Miscanthus floridulus
 l₁₀ Chrysopogon aciculatus
 a ~~Triphasia~~ Leucaena glauca
 c Triphasia trifolia
 c Clerodendrum inerme
 c Callicarpa cardians
 lc Stachytarpheta indica
 lc Cassytha filiformis
 lc, n Wedelia biflora
 o Morinda citrifolia
 o Psidium guajava
 o Ficus leontopetaloides
 o Psychotria manana
 o Hyptis pectinata
 o Waltheria indica
 o Passiflora foetida
 o Ipomoea indica
 lo Fimbristylis obtusifolia
 lo Cassia occidentalis
 n Hyptis capitata
 n Sida acuta
~~Cantharospermum~~
 n Cantharospermum ^{occasional}

Jan 29 Ylig Bay

The swamp here is poorly developed near

In patch of Miscanthus

55647

Cassia

4

occasional in sap grass

4

78

~~Cantharospermum~~

near edges of scrub on slope

The bay, with a small patch of Phragmites, some Nipa and Hibiscus abacaus. 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 bisectata
 o Pennisetum polystachyon
 o Morinda citrifolia
 n Cassia sp.
 n Psychotria manana
 n Ficus tinctoria
 n Premna obtusifolia

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

in limestone.

60 m.

weak shrub up to 1 m tall, flowers yellow, fruit succulent, shrub 7 m tall, stem;

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

predominant 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 *Clorodendron inerme*
o *Triphasia trifolia*
o *Morinda citrifolia*
o *Sida acuta*
o *Columbinia asiatica*
n *Cassia occidentalis*
n *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 base of leaves

1954 Guam

- 35650 *Echinochloa*
dominant locally
in mud
- 2 51 *Cichorium crassifolius*
dominant locally in mud
- 1 52 *Ipomoea aquatica*
common locally in mud
- 2 53 *Sida*
common on moist ground
- 1 54 *Convolvulus*
rare on moist ground
- 1 55 *Erotaria quinquefolia*
rare on moist ground
- 1 56 *Ipomoea*
cultivated, climbing house

Jan. 30 - n. side Pago Valley
57 *Bambusa vulgaris* Schum. & Thonn. ^{MS}
in thickets _{Malina}

Jan. 30 - hills behind
Inarajan, n. of Inarajan
Valley

- 6 58 *Euphorbia*
local along roadside in
volcanic soil.
- 2 59 *Sida*
local on 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 acroides*
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.

-1 m. rhizomes buried in
mud; sterile.

2 m. small tree; flowers
white.

1 m. forming a sod.

2 m. small spreading
tree, pods pendent.

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

35668 *Fivistoma chinensis*
cultivated

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

69 *Hedyotis foetida* var. *maianensis*
common on bare limestone
ledges.

70 *Digitaria gaudichaudii*
rare on bare rock ledges.

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

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

same - in thick forest
on slope at bottom of cliff

73 *Psychotria*
rare

tree about 4^{1/2} m. tall,
trunk without definite
scars, but with
ringlike roughening
near the top. panicle
axillary; fruit dull
greenish, turning black,
branches 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* Fesch. 1 m.
common on sand
- 75 *Cenchrus brownii*
rare on sand
- 76 *Lymnospira*
rare, two small patches
seen on sand bottom
in about 1 m. water

Jan. 31 - east of Agaña
secondary forest
with, locally, a few
big trees of *Elaeocarpus*
fair sized ones of *Clavylon*
Achrosia, *Aglaia*, etc.
with fairly complete
canopy at about 10 m.
Walking is not too bad
without machete, but
easier with one.

Composition:

- c *Aglaia mariannensis*
- c *Ficus prolixa*
- c *Clavylon mariannense*
- c *Guamnia ~~mariannensis~~*
- c *Hibiscus tiliaceus*
- c *Achrosia oppositifolia*
- c *Pandanus tectorius*
- c *Flagellaria indica*
- c *Triphasia trifolia*
- c *Elaeocarpus gona*
- v *Artocarpus altilis*

alt.

1 m.

1 m.

-1 m.

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 guamanense*
- c *Cissocaulis*
- fem - terrestrial
- Nephrolepis bisectula*
- fem - epiphytic
- Davallia solida*
- Asplenium nidus*
- Polypodium punctatum*
- Polypodium scolopendria*
- Asplenium laciniifolium*
- Asplenium falcatum*
- Bolbitis spicata*
- Pternata heterophylla*
- Nephrolepis acrifolia*
- Antrophyum serrulatum*
- Vittaria elongata*
- other epiphytes
- Deschidia*
- various orchids

1954 Guam

along recently cleared roadway in this wood 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, *Acetaria curassavica* and especially *Nephrolepis bisectata* are conspicuous, and vines of *Ipomoea indica* and *Panicum* ~~indica~~ are common. and this is a ruderal community seen very commonly in the plateau forest immediately following disturbance.

Jan 22 - Anas.

Area proposed to governa clodge to be set aside as conservation reserve - extending from Anas Point south, and from south boundary of Anderson A & B 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 *intipus*, and are said by the local people to be affected by "bugs" both in roots and tops. *Intipus* 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 *Guamnia marianensis*
- c *Cycas circinalis*
- c *Carica papaya*
- o *Pseudomorus lunariensis*
- o *Triphasia trifolia*
- c *Pandanus dubius*
- o *Intsia bijuga*
- c *Tristropsis*
- o *Morinda citrifolia*
- o *Raportea latifolia*
- o *Cynometra*
- c *Premna sacle obtusifolia*
- o *Psychotria mariana*
- o *Pandanus tectorius*
- o *Macaranga*
- o *Clasocarpus zoga*
- o *Hibiscus tiliaceus*
- o *Pouteria*
- o *Ailophylus*
- o *Iron triantha*

Nephrolepis hispidula
Polypodium scolopendria
Alysic 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, largely made up of:

- a *Triphasia trifolia*
- c *Polypodium scolopendria*
- c *Cynometra*
- c *Asplenium nidus*
- o *Psychotria mariana*
- o *Ficus prolixa*
- 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 *Guamnia marianensis*
- c *Quettarda speciosa*
- c *Plectheria marianensis*
- c *Guamnia marianensis*

- c ~~Cyperus~~ Colubrina asiatica
 - c Chynometra
 - c Triphasia trifolia
 - o Ochrasia oppositifolia
 - o Ficus prolixa
 - ~~o Ficus maximae~~
 - r Grewia
- and with smaller plants:
- a Asplenium caudatum
 - c Phyllanthus marianus
 - o Nephrolepis bicaudata
 - o Polypodium scolopendria
 - o Peperomia
 - o Jasminum simplicifolium
 - r Polypodium grandifolium
 - o Alyxia tomentosa
 - Asplenium nidus
 - Procris pedunculata

Forest on slopes at foot of cliff:

- a Ochrocarpa odorata
- c Aglaia mariannensis
- c Guettarda speciosa
- c Hibiscus tiliaceus (a in lower part)
- c Cycas circinalis
- c Triphasia trifolia
- o Morinda citrifolia
- r 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 barren field (the term "barren" is used for barren field by Guamanians) about 50 m wide, inside of which is a gentle slope of gravel.

The barren field is covered by a discontinuous low matted vegetation of

- a Pemphis acidula
- c Firmistylis
- o Heliotropium anomalum
- o Hedyotis albido-punctata
- o Leucaena seedling
- r Euphorbia tinianensis

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

Inside the Karasampelo 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 cordata and Capparis cordata.

Inside this is a belt of Hibiscus tiliaceus and Clerodendrum inense 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)

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

Ahgal - Premna obtusifolia
Makupa - Eugenia javanica
~~Lavate~~ - fruit eaten
Laniti - Blechnum nananense

Sosgo - Glochidion marianense
Ketule lala - Cassytha 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 anita - Piper guahamense
(Pupulo - Piper beetle)

Mapuno - Aglaia marianensis

Paipai - Ficus marianensis
wood used for fence handles and rafters.

Federico } Cycas circinalis

Fadang } Cycas circinalis

Aplok Kating - Psychotria
mariana

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

Angilo - Grewia
wood very flexible, used for houses.

Guagnahot - Josa triantha

Agatalano - Eugenia sp.

Perqua - Macaranga thompsonii
wood used for firewood and building lumber.

Chopag - Ochrocarpos odoratus

Ketule palawan - Sapota latifolia
bark said to sting skin when dry. (Palawan woman)

1954 Guam

Sumac - *Randia cochinchinensis*Atot - *Discocalyx*

fruit edible

Julus - *Cynometra*Ledean - *Alysic torriana**Morinda umbellata**Jasminum simplicifolium*

vines said to be very strong, three different kinds

Ifil - *Portia bijuga*

much logged before war.

stumps and some logs

still lying around from

1917 (see Blas), those

examined not much rotted.

Taken out on sleds pulled

by carabao.

Tupunayuga - *Procris pedunculata*

trans. coconut crab sugar cane

Pot puput - *Dischides**Peperomia*

two kinds recognized, the

Peperomia used medicinally.Lulubut - *Meytenia*Laso katu - *Achyroanthus asper*Gansau - *Colubina asiatica*Ledegan - *Clerodendrum inerme*

Tea of dry leaves used for

high fevers.

Noolung - *Pisonia grandis*Amlat - *Calliandra cardiantha*Atapanis - *Capparis cordata*Janara - *Scaevola frutescens*Inqaa - *Pomphos acidula*Tangatangau - *Senecio glauca*Piga - *Alouasia* (with green
edible petioles)Papan - *Alouasia* (with brown
inedible mottled stem)Alum - *Melastoma multiflorum*Paga - *Ochroma oppositifolia*Pakau - *Caesalpinia major*

Bihuan maluntuan -

Flagellaria indica

trans. "wild wicker"

(to contrast with an intro-

duced bihuan from Philippines

used in handicraft)

Munmutuman - *Hiptis pectinata*

Jan 22 - Naval Air Station

of Agaña Nursery

(see p. 105)

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 nirous

Euphorbia pulcherrima

Tagetes

Colera scutellaria

Polycissis guelfoylei

Gambusia sp.

Pseuderanthemum (x form)

Codiaeum variegatum

Plumaria rubra

Pedilanthus tithymaloides

Fansea ruscifolia

Polycissis scutellaria

Polycissis fruticosa

Hibiscus (ornamental hybrids)

Leindapsus aureus

Acalypha sp.

Zebraea pendula

Hemigraphis retorta

Capriocarpus indica

Ficus parvifolia

Hedyochium sp.

Mercuria sp.

Acalypha hispida

Capricorn frutescens

Gardenia jasminoides

Canva sp.

Crinum araticum

Zephyranthes candida

Caladium bicolor

Ipomoea quamoclit

Caesalpinia pulcherrima

Polygonum tuberosum

Sambucus canadensis

Jatropha multifida

Zinnia elegans

Gomphrena globosa

Heliconia bihai

Acalypha amantissima var. wilkesiana

Casuarina equisetifolia

Cordyline terminalis

Malvarisera

Graptophyllum pictum

Sambucus saman

Terminalia catappa

Erythrina variegata

Alacis confusa

Bixa orellana

Cassia alata

Barringtonia asiatica

Cocos nucifera

Catalpa longissima

Cassia fistula

Xanthosoma sagittifolia

Punica granatum

Alpinia spectabilis

Casuarina glauca

Adenanthura pavonia

Heliconia sp.

Impatiens balsamina

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

Tabebuia pentaphylla
 "Kentia" palm
Tithonia diversifolia
Casia fistula
Xora coccinea
Xora casei
Roystonia olaracea

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

Vernonia names supplied
 by owner of Guam Florist.

Peperomia spp.
Schlotheimia aurea
Phyllodendron spp.
Phoenix sylvestris? (small)
Vanda x *Mis* *foqueia*
Monstera deliciosa

Araucaria excelsa
Impatiens sultana
Trachycarpus excelsus?
Chamaecyparis humilis?
Strelitzia reginae
Pelargonium zonale
Gardenia jasminoides
Tabebuia pentaphylla
Dioscorea maculata
Vitis sp. (sterile)
Pellionia pulchella
Brassia actinophylla
Murraya paniculata
Spathiphyllum 3 spp.
Anthurium
Lundbergia (or *Leptocarpus*?) *argentea*
Calathea (with sharp pink stripe)
Cratogeomys montana
Raphidophora (or *Epiphyllum*)
Lancea cylindrica
Kalanchoe (small fl.)
Kalanchoe (large marginal fl. 2' diam.)
Haworthia (distichone)
Aloe spp.
Thuja orientalis
Chromolaena rubra - *calceolaria*
Alpinia purpurata
Nepenthes cordata
Xora casei
Nepenthes bicalcarata v. *furcata*
Thevetia peruviana
Agave sisalana (but with
 no pinnules and soft throat points)
Melia azedarach - *paraiso*
Caesalpinia pulcherrima - *caballer*

~~7/11/54~~

Malvaceae

*Sida acuta**Jasminum pubescens*- *canaliculata**Chrysanthemum indicum**Cyphomandra**Bauhinia blakeana*(brought to Esp. Sta. from
Hong Kong, spoken of at
Esp. Sta. as a hybrid)Jan. 23 - Farapohan Tr. and adjacent middle talofofa Res. Basin.
(coll. from p. 129)

Ravine forest type in crevice 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* community here is pure *Miscanthus* except in thin places and small openings. It has been burned or old blackened grass stubs show. No *Casuarina* seen. In thin places and small openings may be found:

- c *Hypochaeris capitata*
- a *Chrysopsis aciculata*
- c *Cuscuta ochroleuca*
- bc *Mitracarpum hirtum*
- o *Immeria chloridifera*
- o *Sporobolus elongatus*
- c *Paspalum obtusum*

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

- 1a *Chrysosporon aciculata*
 1a *Mitrocarpum birtum*
 1c *Waltheria indica*
 1c *Hypolepis capitata*
 2c *Stachytarpheta indica*

The lowest part of the basin, along the river is a complex of swamps, forest and reed marsh, separated from the river by a broad low natural levee. This level is covered mainly by *Hibiscus tiliaceus* with occasional *Arceuthobium* and a few *Hernandia* areas. The swamp forest is a mosaic with some pure *Barringtonia racemosa* among the trees and hummocks separated by knee-deep water. Canopy generally complete, no winding paths. Tall trees or branches occasional. Some *Hibiscus tiliaceus*, almost a pure stand, some mixed.

- a *Barringtonia racemosa*
 a *Arceuthobium*
 c *Pandanus tectorius*,
Barringtonia seedlings
 abundant, also *Alouaria*
 and *Aphrasmenus* on ground.
 Patches of reed swamp.

In this flat low ground are occasional denudations of volcanic breccia (breccia formation) partly covered by sword-grass, partly by ravine forest and scrub. The flats just above the swamps have *Arceuthobium* groves with some *Hibiscus tiliaceus* and with thin undergrowth of *Piper guahanense*. The ravines running into this all around have ravine forest, largely *Hibiscus tiliaceus*, but with *Pandanus*, *Cycas*, *Arceuthobium*, *Ficus potius*, *Triplaris*, etc.

Jan. 20 - West of Yigo
 Inspection with Manuel
 Calvo, Commissioner of Yigo

Jan. 20 - 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 (cross
 from Jose White property)
 runs along a ridge of
 rocky ground (barney-
 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 are Calvo
Pomora per-copras - balaihan
Pomora vilifolia - alalok

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

Agave americana (cattail)
 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 *Dimeris* grassland, but most of the area is *Misacanthus* and erosion scars.

Composition in *Misacanthus* area and smaller disturbed places:

- o *Misacanthus* ~~sp~~ *floridulus*
- la *Elephantopus mollis*
- la *Stachytarpheta indica*
- la *Glechoma linearis*
- c *Hypochaeris capitata*
- c *Glochidion orianum*
- c *Leucaena glauca*
- c *Ernilia javanica*
- lc *Nephrolepis bicuspidata*
- lc *Polygala paniculata*
- lc *Mitrasaccharum hartum*
- lc *Curculigo orchivoides*
- lc *Lygodium scandens*
- lc *Ageratum conyzoides*
- o lc *Dianella*
- o *Dimeris chloridifera*
- l *Thunbergia ~~involuta~~ ~~canadensis~~*
- l *Conchocarpus schumannii*
- r *Ipomoea littoralis*
- r *Pandanus tectorius*
- r *Chailanthes tenuifolia*
- Scaevola frutescens*
- Pennisetum polystachyum*

- Sida acuta*
- Chrysopsis aciculata*
- Desmodium triflorum*
- Psidium guajava*
- Phragmites Karsten (in ravine)*

- Small areas of *Dimeris* seem to be not significantly different physiographically from the *Misacanthus* areas.
- la *Waltheria indica*
 - lc *Paspalum orbiculare*
 - lc *Rhynchospora rubra*
 - o *Fimbristylis annua*
 - o *Fimbristylis sp. (sp.)*
 - l *Fimbristylis cynosu*
 - r *Walteria indica*
 - r *Myrtella banyuwangensis*
 - r *Geniostoma*
 - r *Jasminum simplicifolium*

1954 Guam

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

About 11-12" total length.
Beak about 1 1/4 - 1 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 *Hentiera*
Hibiscus tiliaceus, *Bruguiera*
and *Clerodendrum inermis*

East of Merizo the
strand is lined with
Thespesia, etc. Coral terrace
just above high tide,
with occasional low
Pennisetis 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 *thioya* soil - weedy,
with *Pandanus*, *Leucaena*,
Quettarda, *Musa*,
Pithecellobium, *Carex*
under sparse coconuts.
A few breadfruit trees
and *Triphasia* clumps.
Principal weeds are,

Stachytarpheta indica
Sida rhombifolia
Urena lobata
Hymenocallis nodiflora
Ipomoea pes-caprae
Thuarea involuta
Chrysopsis 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
ghiesbreghtii, Hibiscus tiliaceus,
Scaevola, Avicennia, and
Fernandia, with Clodendron
inermis, Perris 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:

- c Ochrosia oppositifolia
- c Cycas circinalis
- c Aglaia maurandensis
- c Macaranga thompsonii
- c Pandanus tectorius
- c Morinda citrifolia
- c Premna obtusifolia
- c Ficus prolixa
- c Artocarpus altilis
- c Guarea maurandensis
- c Triphasia trifolia
- c Cestrum diurnum
- c Flagellaria indica
- c Melanolepis multiglandulosa
- v Carica papaya
- v Piper guahamense
- v Eugenia reinwardtiana
- v Cordia subcordata
- v Pouteria 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*, *Quararuba*, *Flagellaria*, *Piper* young *Aglave*, 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*, *Criconia grandis*, *Psychotria malaspina*, and *Pipturus argentes* are additional species. The forest is lower, *Achras* 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
 a *Bibbia marianensis*
 c *Leavenolea frutescens*
 c *Triplaris trifolia*
 c *Phyllanthus marianensis*
 c *Achrocarpus odoratus*
 c *Hedyotis foetida*
 o *Cestrum diurnum*
 o *Pisonia grandis*
 o *Cycas circinalis*
 o *Psychotria mariana*
 o *Pipturus argentes*
 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 (7 m above sea) there has at some time been considerable clearing. The flats just above the beach have been planted to coconuts.

The general composition on cliffs and terraces is
 c *Artocarpus altalis*
 c *Clasylon*
 c *Quararuba marianensis*

1954 Guam

- c *Cynometra*
 c *Pandanus tectorius*
 c *Cycas circinalis*
 c *Aglaia marianensis*
 c *Viburnum trifolium*
 c *Pronna obtusifolia*
 c *Macaranga thompsonii*
 c *Calrossia oppositifolia*
 c *Chytranthus marianensis*
 c *Tectaria crenata*
 ca *Tristropis (lowland)*
 o *Vatica byrgea*
 o *Blechnum marianense*
 c *Ficus prolixa*
 c *Guettarda speciosa*
 bc *Pipturus argenteus*
 a *Ficus tinctoria*
 a *Cecropia leontopetaloides*
Carica papaya
Flagellaria arida
Piper guahamense
Melochia
Raportea latifolia
Pisonia grandis (lowland)
Hernandia sonora (lowland)

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

Mayrera thompsonii
Calophyllum paniculatum
Strobilanthus strigosus
Calophyllum thymocarpum

Calophyllum thymocarpum - wood much harder & heavier than breadfruit. Can also rot like sugar pine & white pine in durability.

Feb. 3 - talked with Kipp about Guam timbers.

Faya (*Tristropis*) - 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 & banded structure.

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

Ifil - good timber, lasts well - Foundation upward of 150 years old still sound. Known to stay sound for at least 100 years in Philippines in contact with ground corrodes steel screws and nails.

Claude Fowler (OPM) is man who found fossil palm wood saw in 1951 - 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 Communication Camp area.

Very low vegetation
 Submontane forest
 Montane forest
 Vegetation barrier
 to the north

1954 Guan

Jan. 20, 1954.

Low altitude flight in cabin plane with Tracy 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 St. Santa Rosa.

Flat back of Tuzon 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 Esas is ravine forest, mostly of *Hibiscus tiliaceus*.

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

Sattil 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 so 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 San-Juan-Sattil should be indicated on the map as relatively good limestone forest, not completely altered.

1954 Guam

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 Soaya limestone area are surrounded by belts of reeds.

South of Orote Pev. 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 Leucaena. 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 Fina 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 Warbu has large numbers of dead trees. The forest just south of Anderson A.F.P. 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 Mataguc Hill. The grassy area on Mataguc is smaller than on my veg. map.

May 20, 1954
Polypodium punctatum
Polypodium striatum
Polypodium guianense

May 2nd Thompson
 1st 2nd 3rd 4th 5th 6th 7th 8th 9th 10th 11th 12th
 13th 14th 15th 16th 17th 18th 19th 20th 21st 22nd 23rd 24th 25th 26th 27th 28th 29th 30th 31st

1st 2nd 3rd 4th 5th 6th 7th 8th 9th 10th 11th 12th
 13th 14th 15th 16th 17th 18th 19th 20th 21st 22nd 23rd 24th 25th 26th 27th 28th 29th 30th 31st

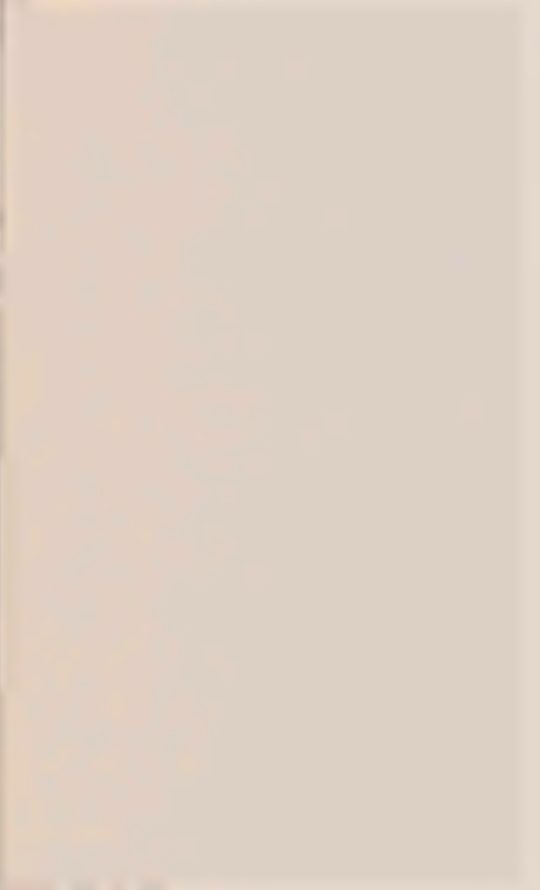


1st 2nd 3rd 4th 5th 6th 7th 8th 9th 10th 11th 12th
 13th 14th 15th 16th 17th 18th 19th 20th 21st 22nd 23rd 24th 25th 26th 27th 28th 29th 30th 31st

115

1870
May 12

Dear Mother
I received your kind letter
of the 10th and was glad
to hear from you
I am well and hope
these few lines will find
you the same
I have not much news
to write at present
I am your affectionate
son
John Smith



I have not much news
to write at present
I am your affectionate
son
John Smith

37