RECORD

F. R. Fosberg
Field notebooks

Collection and Field Note Book

No. 68

(Oct. 14, 1962 - Jan. 25, 1963)

(1962-1963)

1-2	.....	Colombia (from air)
3-4	.....	Colombia (from air)
5-6	.....	Colombia (from air)
7-8	.....	Colombia (from air)
9-10	.....	Colombia (from air)
11-12	.....	Colombia (from air)
13-14	.....	Colombia (from air)
15-16	.....	Colombia (from air)
17-18	.....	Colombia (from air)
19-20	.....	Colombia (from air)
21-22	.....	Colombia (from air)
23-24	.....	Colombia (from air)
25-26	.....	Colombia (from air)
27-28	.....	Colombia (from air)
29-30	.....	Colombia (from air)
31-32	.....	Colombia (from air)
33-34	.....	Colombia (from air)
35-36	.....	Colombia (from air)
37-38	.....	Colombia (from air)
39-40	.....	Colombia (from air)
41-42	.....	Colombia (from air)
43-44	.....	Colombia (from air)
45-46	.....	Colombia (from air)
47-48	.....	Colombia (from air)
49-50	.....	Colombia (from air)
51-52	.....	Colombia (from air)
53-54	.....	Colombia (from air)
55-56	.....	Colombia (from air)
57-58	.....	Colombia (from air)
59-60	.....	Colombia (from air)
61-62	.....	Colombia (from air)
63-64	.....	Colombia (from air)
65-66	.....	Colombia (from air)
67-68	.....	Colombia (from air)
69-70	.....	Colombia (from air)
71-72	.....	Colombia (from air)
73-74	.....	Colombia (from air)
75-76	.....	Colombia (from air)
77-78	.....	Colombia (from air)
79-80	.....	Colombia (from air)
81-82	.....	Colombia (from air)
83-84	.....	Colombia (from air)
85-86	.....	Colombia (from air)
87-88	.....	Colombia (from air)
89-90	.....	Colombia (from air)
91-92	.....	Colombia (from air)
93-94	.....	Colombia (from air)
95-96	.....	Colombia (from air)
97-98	.....	Colombia (from air)
99-100	.....	Colombia (from air)

Collection and Field Note Book

No. 66

(Oct. 14, 1962 - Jan. 25, 1963)

(43245 ----- 43403)

	<u>Pages</u>
Mexico.....	1-5
(from air)	
Guatemala.....	6-9
(from air)	
El Salvador.....	10
(from air)	
Nicaragua.....	10
(from air)	
Costa Rica.....	11-31
Specimens collected 24-31	43245- 43288
Panama.....	30-34
Colombia.....	34-39
(from air)	
Ecuador.....	39-41
" "	
Peru.....	41-47
" "	
Brazil.....	48-87

Specimens collected	(58-65	43289-43332
Sao Paulo	(68-73	43333-43367
Guanabara	84-87	43368-43390

Virginia.....	88-99
	108-109
Fairfax County	90-97 43391 - 43397
Specimens collected	90-91
Stone House, w. of	
Bull Run	98-99
Wildcat Mt. Preserve	98-99
Fairfax County	108-109
Culpepper-Sleepy Hollow	
Maryland	100-107
	110-111
Worcester County	100-107 43398
Specimens collected	106-107
Prince Georges County	100
South River-Tarnan Br.	110
Ivy Neck	111
France.....	112-114
Fontainebleau	
Specimens collected	112-113 43399- 43403

Field Notebook
66

Those plants collected by Dr. Fosberg at "Alta da Serra" have the following data: Brazil, State of São Paulo, Município de Riberão Pires, nature reserve of "Alto da Serra", about 1/2 to 1 km west of city of PARANAPIACABA. Subtropical, montane low rainforest or scrub.

p. 68

Those plants collected in the cerrado at Emas...the following data; Brazil, State of São Paulo, Município de Piracicaba, Emas. Cerrado vegetation, open to semi-closed scrub or scrub forest. 27 Oct. 1962.

p. 64

→ to 43327

George Eiten

p. 64 on

all labels done & rechecked

F. R. Fosberg

Field notebooks

66

begin 43245

end 43403

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A front is apparently a real thing - two parallel sinuous ~~bands~~ ^{some} of cloud ~~several~~ miles apart perhaps a mile wide, the north side lower, sloping evenly downward from a lumpy cumulus on south to a smooth wispy strato-cumulus or stratus to north, this simply fading out.

ground
wind
e.n.e.
at Monty.
ca. u.s.w.

Another broken piece of similar cloud farther south.

Must be either from a north wind sliding up over an air mass or a south wind pushing in under one - probably the former 11:05 a. bet. at. Mt.

1962

no. of mob. in sparsely settled area, generally forested are some broad thinly vegetated sand-hills(?) or elevated sand flats. Into these, from north, and somewhat also from south, are what look like systems of tidal channels, filled with woods.

photos of Alacran, Progreso coast, ~~at~~ sisal plantation. S. of Merida - a patchwork of sisal patches, abandoned sisal patches, scrub and scrub forest. Beyond the main plantation area, a few miles south the large scrub open scrub forest, and scrub forest areas are spotted with small clearings. The scrub and forest are a patchwork of regrowth of various ages. Broad strips of sisal plantation extend south along highways and are scattered along a new road running transverse to the course.

South of this cultivated patches are abundant - active and just abandoned ones occupying perhaps 10-20% of area, as far as first range of low hills. South of this there are some patches and locally plenty of regrown abandoned ones, but mainly forest over large areas, even along the road parallel to course on left. Some ~~part~~ areas are quite heavily cleared south of hills. Also some local savanna areas, with irregular mosaic of wooded patches and grass. Area n.w. of ~~that~~ Ticul is rather heavily cleared for shifting agriculture, less so but still heavily southward around Santa Elena. Beyond this large areas of fair forest with only faint angular patterns alternating with areas that are mostly cleared, irregular patches of savanna, then mostly unbroken forest with no visible evidence

that it ever has been cleared.
This is mostly flat, but
locally gently hilly.

20 min. out Then a new road transverse
to course - prob Bolonchentic
rd. but no clearings
along it. South of this
several minutes several
faint traces wandering
eastward through the
dense forest, and one
southward along course
to several clearings
perhaps Sahcabchen - but
as far as visibility extends
to east, generally solid
forest.

Several open patches,
irregular, only one of them
shows any indication of
buildings, no cultivation.
Several seem marshy
but most just brownish
green grass, southward
these tiny spots become
fairly common. Some
black small ponds (cenotes?).
and some marshes or
swamps with ponds in
them. One tiny clearing
with a building.

But mostly forest
no more opening, then
a black stream

with some swamp south
of it across course, a meandering
tributary enters from south
along course. Then several
~~flat~~ medium savanna
areas in forest, with ponds
and a large muddy lake.
~~then~~ then forest, then
a patch of savanna
of large size somewhat
to left, surrounded
by forest, low karstlike
hills nearer course, densely
forested, then flat forest
and a savanna patch
along course, then a muddy
river across course with
a black winding lake
south of it, a village on it
to left, and a large swamp
south of this, south of it
a black lake of some size.
then vast forest, a small
meandering stream with
meadow or marsh along it,
a clearing on it with a
road leading to it from south,
otherwise forest. Then a
wrinkled bit of karst
and on course a large
meandering muddy river
more karst patches, then
a mountain front with
karst behind it, all densely forested.

45 min
out

Some faint streams.
 Extreme heat, ~~to~~ with
 flat ground between,
 hills forested, flat ground
 meadow. Then a stream
 gorge. More heat and
 green grassy meadows.
 Scattered tiny houses.
 A small cultivated valley,
 then a deep canyon
 across course with a
 muddy stream in it.
 Then dissected country,
 no longer limestone-
 45° slopes partially
 wooded, ridges tending
 to be grassy, relief high,
 very mountainous. ~~Some~~
 more and more denuded,
 then cleared patchwork
 hills very much ~~to~~
 cultivated except steeper
 parts, brownish green.
 Then semi-cleared,
 semi wooded very
 dissected country, locally
 densely settled, locally
 not, but becoming
 more and more cleared
 and denuded southward.
 Some forested areas.
 Locally 75% wooded, locally
 10%. Varying. Streams
 in canyons become red muddy.

Country generally cleared
 grassy or scrubby, only a
 few patches of forest. Quite
 a few roads on ridges.
 Approaching Guatemala City,
 sharply dissected plateau
 intricate canyons with
 very steep sides, flat-topped
 or sharp ridges, mostly
 wooded sides, tops cultivated.
 This north of Guatemala
 City. The city is on this
 plateau but less dissected.
 Guat. to San Salvador.

South of Guatemala City,
 around Lake Amatitlan
 flat topped hills,
 slopes mostly wooded,
 some cleared, flat tops
 cleared and cultivated.

Visibility very poor.

Rolling country south
 partly wooded, partly
 cleared, another part
 cleared, rougher parts
 wooded. Mountains to
 right of course mostly
 mostly wooded, to left
 cleared to tops.

Dissected country to right,
 mostly cleared. All cleared
 ground s. of Guat. City bright
 green. More gently rolling
 cleared country, ravines wooded.

1964 Guatemala -

Relief gets lower but dissection more intricate. Ravines still wooded. Visibility very poor.

After a few minutes, a mountainous region with long ravines converging backward along course, mostly cleared. Higher peaks ahead in clouds. Some parts apparently cultivated, hedges between patches, mostly pasture with some scattered bushes. Bottoms of ravines wooded.

Then no visibility. A sharp mostly wooded peak sticking up out of the clouds. A few clearings on slopes.

Then a cluster of wooded mountains to left, a plain, mostly open, to right. A city (Santa Ana?) at base of mountains. Course turns left, along a broad flat valley, mostly cleared. Hedgerows between fields - fields green. Then broad flat valley laid out in squares - doubtless sugar

cane, but if so, mostly harvested. Many fields brownish green.

Railroad crosses the lake just beyond it.

Ravine in plain with gallery. Course turns left to meet a high mountain, wooded on upper slopes. A broad black lava flow on sides. Beyond this a densely wooded slope. A high cone on end of this range. Beyond it basin with San Salvador.

The area just before the lava flow ~~is~~ is green, grassy, possibly a flow that is not yet wooded, but possibly also cleared.

Considerable forest locally around San Salvador.

Area around airport a deeply dissected plateau, ravines are wooded gorges.

Plants at airport -

Dolichos lablab

Hibiscus hybrid

Codiaeum variegatum

Stenotaphrum secundatum

Alternanthera versicolor

Chrysolidocarpus lutescens

El Salvador - Managua
E. of San Salvador, around
lake, flat ground is
cultivated, steep slopes
partly wooded, partly
grassy. Slopes ~~are~~ go
steeply down to lake.

Eastward relief is
not great but there
is dissection. Ravines
are wooded, flatter ground
cultivated.

Coastal plain largely
clear, large fields separated
by hedge rows, more
inland the fields are
smaller.

Plain of Rio Lempa almost
all cleared and in plantation
prob. sugar cane.

Complex area of swamps
and lagoons east of Rio Lempa.
sugar plantations inland
and along coastal strip
where it is wide enough.
Swamp gets narrower
eastward toward mouth.

Visibility very poor.

Managua airport - plants
Codiaeum variegatum
Pseuderanthemum carnathensis
Rauwolfia inermis

Oct. 14
San Jose -

Euphorbia cotinifolia red form
(*E. coccinea*)

Cyperus papyrus

Polybodium aureum

Euphorbia pulcherrima

Spathodea campanulata

Nephrolepis exaltata

Fetcreasia purpurea

Cosmos sulphurea

Alpinia purpurata

Agave americana

Acalypha hispida

Malvaviscus arboreus

Cordyline ~~terminalis~~ distichos

Anacardium bidwillii

Bidens leucantha

Euphorbia leucophylla

This season has been
very rainy - rain every
afternoon. Oct. + Nov.
said to be rainiest period.

Gladiolus

Lisianthus caryophyllus

Delonix regia

Albizia ~~maxima~~ mant

Lobularia maritima

Euphorbia bojeri (= *miliis*)

Plumbago auriculata

Drymaria cordata

Axonopus compressus

Thuja orientalis
Begonia nivalis
Vietchia meunillii
Crescentia cujete
Yucca elephantipes?
Euphorbia tirucalli
Kalanchoe verticillata
Euphorbia spathulata (?) *stratata*
Blechnum pyramidatum
Kalanchoe pinnata
Lantana camara
Hemerocallis fulva
Blechnum occidentale
Cereus undatus
Pilea microphylla
Apium ~~leptophyllum~~
Caladium bicolor
Xanthosoma sagittifolium
Synedrella nodiflora
Nephrolepis cordifolia
Pistia stratiotes
Eichhornia crassipes
Thevetia peruviana
Ficus elastica
Eriobotrya japonica
Asparagus plumosus
Carludovica palmata
Vernonia
Caesalpinia pulcherrima
Casimiroa edulis
Monstera deliciosa
Persea americana
Saccharum officinarum

Gliricidia sepium
Spondias mombin
Psidium guajava
Beloperone guttata
Philadelphus (large fl.)
Acalypha wilkesiana
Cyperus alternifolius
Schinus molle
Nerium oleander
Hibiscus schizopetalus
Musa sapientum
Codiaeum variegatum
Grevillea robusta
Coffea arabica
Colocasia esculenta
Carica papaya
Carica candamarcensis
Oenothera (Raimondia) cf. *stricta*
Pilea microphylla
Bauhinia cf. *purpurea*
 (5 stamens)
Cassia alata
Chrysanthemum pyrenaicum
Impatiens sultana
Polyscias fruticosa
Chenopodium ambrosioides
Apium leptophyllum
Solanum nigrum
Lepidium virginicum
Verbena ~~officinalis~~ *officinalis* ?
Plantago major
Euphorbia hirta
Althaea (hollyhock)
Hedera helix

Sansiveria guineensis
Sporobolus africanus
Leindolpus aureus
Antigonon leptopus

Oct. 15 - trip by auto from San Jose to Turrialba

Out of San Jose -
Coffee plantations,
trimmed to about 1.5 - 2 m.
shaded by scattered
Erythrina, *Inga*, and,
locally, bananas.
The *Erythrina* trimmed
down to approximate the
habit of the *Inga*.

The canopy varies from
almost complete but thin
to perhaps as little as
15%. Clumps of taller trees
around houses. *Cupressus*, *Canarium* etc.

Tres Rios

Mts. have patches of
forest and patches of bright
green grass. The forest mostly
in ravine heads and on
steep slopes. Many patches
of sparse to dense brush.

Climbing up from Tres
Rios road enters a plateau
of rolling hills, grassy
except for small moist
patches, wooded ravine
bottoms, and hedgerows
separating fields. These
are very conspicuous.
Banana patches and small

Plants seen on road
not already seen in San Jose

Oxalis variabilis
Tibouchina semidecandra
Impatiens balsamina
Zea mays
Reunus cornutum
Agave cf. sisalana
Cosmos tinctoria
Nopalea cochenillifera
Neium indicum
Salvia splendens
Pelargonium zonale
Duranta repens
Duranta sp. (large fl.)
Ipseus herbstii
Pennisetum purpureum
Melinis minutiflora
Stachytarpheta (large, purple fl.)
Catharanthus roseus
Pteridium aquilinum
Bocconia frutescens
Asclepias curassavica
Mimosa pudica
Miscanthus sinensis ???
(det. Cervantes & Juan Viera)
Eugenia jambos
Cassia alata
Ochroma pyramidalis
Hippobroma longiflora
Tibonia diversifolia
Alocasia macrura ?
Terminalia catappa
Celastrum argentea

cult.

coffee plantations in low places. Hedgerows are very conspicuous - of *Erythrina*, *gloriosa* both pollarded, many other plants.

Beyond Cartago more or less same. Mt slopes to left a patchwork of cultivation, patches bounded by hedgerows.

In distance to rt. partially wooded mts.

Several miles out an area of sugar cane patches.

Paraiso

Rolling plateau with pasture, maize, cane, patches. Some coffee. *Salix chilensis*, *Cupressus*, *Erythrina*, *Crataegus*, large *Yucca* clumps & hedge rows.

Mt. range to rt. largely wooded on higher slopes & ridges, largely cleared on lower slopes.

Well beyond Paraiso considerable cane, also considerable rocky land.

this in pasture but locally with many scattered trees. Patches of second growth, scrub forest and forest. coffee sugar cane on the best sites.

Arwantes.

More and more cane. except on steeper slope.

Lava and volcanic breccia exposed in all road cuts.

Country gets rougher.

Bananas on steep slopes, cane on gentle ones.

Then less rough - rolling terraces, predominantly cane. Bananas on rising sides - where too steep, secondary scrub.

Km 28 Hedges less notable here, but spread of *Euphorbia cotinifolia* (purple).

Juan Villalva Viñas

Less cane, more pasture, coffee & bananas.

Some open secondary scrub forest, varying pasture with scattered trees - some guava.

Mt. to left a matrix of wood & grass. Lower

slopes coffee.

Descending toward
Turrialba coffee becomes
predominant.

Plants seen in Turrialba

Emilia javanica

Tabernaemontana divaricata

Gesneria cordifolia

Allamanda cathartica

Ravenala madagascariensis

Artocarpus altilis

Artocarpus heterophyllus

Hevea brasiliensis

Zebrina

Cassia spectabilis

Caesalpinia pulcherrima

Carthago

Cycas revoluta

Cyphorhynchus

Casuarina stricta

Zebrina

Oct 14 - Auto trip, Turrialba to
Cerro del Monte Irazu

Volcan Turrialba - view
Slopes wooded, lower
slopes cleared. Considerable
area on summit is open,
Budzowski says mainly
covered by *Vaccinium*.

Hedges of *Bromelia*, *Stachytarpheta*, *Euphorbia corollata*,
Erythrina berteriana.

Alnus juncellensis
along ravines. Said to be
planted to improve
pasture - fixes N.

Large trees left after
clearing are *Ulmus* or
Caryopteris mexicana.

Cupressus lusitamica

Slopes of Irazu - patch
rows of fields separated
by hedgerows of *Erythrina*,
Acnistus arborescens, various
melastomaceae, *Cedrela*
toledoi, *Pinus*, *Cupressus*.

2400 m. Montane forest in ravine
of *Quercus*, *Alnus*, *Monina*,
Oreopanax, *Drimys*, *Saurauia*.

photos
Dendropanax, Croton
Cornus disciflora. Fuchsia arb.
trees characteristically
with compact rounded
crowns

Upward Alnus, Juniperus
and Buddleia become
abundant in ravine,
also scattered on slopes.

San Juan de Cheques

More and more trees
in pastures upward,
mostly Buddleia alpinum,
some Desfontainia, Escallonia
Quercus forming an
open sparse forest.

Gunnera in wet
ravines.

Chusquea Coriaria
Km 25

E. side becomes wetter
Very foggy.
mainly European weeds.
Eichornia abundant.

Trees become smaller
and closer together upward
but still open with
Pennisetum clandestinum

Acacia along road
outside fence.

Changes to a sparse
scrub just below summit
at about 3200-3300 m.

Beds of ash, cinders,
scoria

Scrub on s. side spans
damaged by cattle, on
west side closed; at end
just below rim.

Crater is a multiple
one with at least 4 openings
at different levels, each
with a lake or dry ash flat
in bottom. Complicated pattern
of ash beds, much erosion
of inner slopes into numerous
small gullies.

Very little vegetation on
inner slopes - some Perrettia,
Gunnera, grasses. Old trunks
of large ~~tree~~ ash trees
apparently killed by
fumes.

Much steam coming from
crater, even some coming
from ground on rim.
Slightly 90° or so.

photo
 Crisoid scrub
 lines inner slope
 of Vaccinium, Perrettia,
 Gaultheria, Myrtus,
 Arctostaphylos, Myrsine,
 Hypericum, Hesperomeles,
 etc. with Borreria,
 Ocotea, Nertera, Cinna

2840m
 Deep ravine with
 abundant Gunnera
 Chusquea, ferns. Nertera
 epiphytic Vaccinia.

The pattern in
 central Costa Rica seems
 to be that the lower slopes
 of the mountains are
 cleared and either in
 grass ~~or pasture~~ cultivated.
 The fields moderate
 sized, separated by hedgerows
 or "living fences." Locally
 small trees are scattered
 in the pastures. On the
 upper parts of the cleared
 slopes trees become more
 frequent, and *Alnus*
gouldensis is actually
 left or encouraged, even
 planted in the pastures
 to increase fertility (roots
 are full of nodules - dense
 much branched, caused by

Actinomyces alvi, a
 nitrogen fixer. Scrub
 around mountain summits
 locally dense, locally opened
 up by cattle.

Hilly or rolling plateau
 land is generally cleared
 and in pasture or cultivation
 apparently depending on
 age of the lava or ash and
 consequent amount of
 leaching. The best lands
 are in sugar, bananas,
 and coffee. The poorer in
 pasture. Here again the
 fields are separated by hedgerows.

The upper slopes of
 most of the mountains
 seem to be ~~at~~ largely
 still forested.

Acc. to south of the
 valley of the Reventazon
 there are enormous
 areas of uncut forest.

Coffee here is shaded,
 mostly by Inga or Erythrina.

Coffee plantations all
 the way from San Jose to
 Heredia and most of the
 way to the airport.
 Bananas commonly
 planted in with coffee

Oct. 16 - hills west of Turrialba
in hedgerow along road

- 243245 *Myrsine ferruginea*
3 46 *Casearia*?

Oct. 16 - s. slope of Irazú Volcano
in patch of open wood

- 7 47 *Alnus jorullensis*
common

same - in ^{deep} wet ravine

- 3 48 *Nertera granadensis*
hanging from wet cliff

- 1 49 *Nertera granadensis*
on wet ground

- 4 50 *Asplenium*
common on cliffs

- 2 51 *Asplenium*
rare on cliffs

- 1 52 *Grammitis*
rare on rock

- 1 53 *Elaphoglossum*
occasional on rock

- 2 54 (fern)
common on rock

~~same~~ same - ^{near} edge of
deep ravine in pasture

- 1 55 *Cuscuta*?
in grass

- 1 56 *Pennisetum clandestinum*
forming a dense mat

- 6 57 *Alnus jorullensis*
common in forest

1100 m.

500 m.

slender tree 5-6 m. tall
small tree

2400 m.

medium sized tree.

2800 m.

fruit scarlet

prostrate

erect

prostrate; stamens white.

small tree; catkins pendent.

- 43258 *Quercus sapotaefolia*?
common in forest
- 2 59 *Spiranthes*
epiphytic on tree trunk
in edge of forest
- 3 60 *Polypodium*
common epiphyte
- 5 61 *Cornus disciflora*
common
- 4 62 *Monina*
rare in edges of forest
- 1 63 *Fuchsia*
local in edges of forest
- 1 64 *Eryngium*
abundant on grassy slopes
- 2 65 *Drimys winteri* var.
common
- 1 66 *Valeriana*
rare on earth banks
at edges
- 2 67 *Cheilanthes hirsuta* Link det.
common on vertical
earth walls
- 2 68 *Cystopteris diaphana* (Boyd) Blasdell det.
occasional on vertical earth walls
- 4 69 *Lithocarpum lankesteri*
common in forest
- 6 70 *Drymaria*
common on ground in edge
of forest

tree 20 m. tall.

erect; flowers greenish,
roots tuberous, fleshy,
forming a dense mass.

Tree 20 m. tall; fruit green.

shrub 3-4 m. tall,
flowers bright blue
with yellow throat; ripe
fruit black, fleshy.

shrub 1 m. tall
branching somewhat
distichous; flowers rose pink.
heads blue, bracts white.

Tree 10 m. tall, flowers
white; leaves white beneath.
flowers white

Lellinger
1978

leaves white beneath,
brittle.

Lellinger, 1978

tree about 10 m. tall
spikes pendent, flowers white.

Oct. 14 - summit of
Irazú Volcano
in dense ericoid scrub
on steep ash ^{slope}
on inner slope of outer crater rim

- 43271 *Myrsine*
3 occasional
3 72 *Hesperomeles*
occasional
2 73 *Hypericum strictum*
rare
2 74 *Vaccinium*
common
2 75 *Castilleja*
occasional
✓ 76 (fern) *Eriosorus warszewiczii* (Mett.) Lipd
common
2 77 (fern) *Eriosorus warszewiczii* (Mett.) Cipel.
common
3 78 *Gaultheria donnel-smithii*
common
1 79 *Elaphoglossum conspersum* Christ det
rare DBL '79
2 80 *Nertera granadensis*
common on ground
between clumps of bushes
4 81 *Hedyotis cavanum*
common
1 82 *Myrsine donnel-smithii*
occasional
2 83 *Vaccinium*
common
4 84 *Myrtus catesbeii*
common

3280 m.

- small tree, 5 m. tall;
flower yellowish.
shrub 3 m. tall,
thorny; flowers whitish.
flower deep yellow.
shrub 1 m. tall
small tree; fruit
immature

det. Sellsinger, 1978

det. Sellsinger, 1978

- shrub 1-1.5 m. tall.
flowers rose pink; fruit black.

- prostrate, fruit scarlet.

- weak shrub, semi-decumbent,
flowers white.

- shrub, ^{3 m. tall} trunk 1 cm. thick,
inflorescence bearing 4 times.

- shrub 1 m. tall; fruit
immature.

- shrubs 1-2 m. tall,
flower purplish-white; fruit black.

Rox

43285 *Arctostaphylos rubescens*
common

2 86 *Pernettya*
common

2 87 *Coriaria*
common

Oct. 16 - south slope of
Irazú Volcano

4 88 *Nertera granadensis*
abundant on road cut

Plants seen bet. San José &
Airport (beyond Fecedio)
Phoenix dactylifera
Musa ensata

Rapanea
Alseodaphne ~~*Barringtonia*~~ *Barringtonia*
Nicholaena rosea
Lambertia mexicana
Passiflora maximum
Terminalia catappa

Oct. 17 - air trip San José - Panama City
Reventazón valley - a dissected
ash bed - level spots generally
in sugar cane, also many
of gentler slopes - rougher
parts either pasture or forest.
South side, slopes up to
mts. largely coffee plantations
some pasture.

shrub 2 m. tall; flowers
~~at~~ cream white,
maroon at orifice; fruit
black, rugose.

— compact shrub 0.5 m.
tall; flowers white.

— scandent shrub,
branching distichous,
racemes maroon.

3000 m.

forming a dense mat;
flowers yellowish, fruit
scarlet, soft, juicy.

Considerable ~~poor~~ cloudiness,
then a short stretch of
visibility - a river winding
~~meandering~~ transverse to
course but in a canyon.
About 3/4 or 2/3 grass, rest
forest in hilly country.
Fourth east of this solid
forest in mts.

Panama is green at this season.
On Pacific side the shore is
muddy, a belt of mangrove
opposite airport.

Oct. 17 - Airport to 7 rods N.
Plants seen:

Gracilaria exilis
Terminalia catappa
Coccoloba nucifera
Cassipourea equisetifolia
Vetiveria zizanioides
Pennisetum purpureum
Quazuma ulmifolia
Musa sapientum
Panicum maximum
Gleichenia repens
Saccharum officinarum
Artocarpus altilis
Cassia javanica a nodosa
Anacardium occidentale
Codyline terminalis
Mangifera indica
Acalypha wilkesiana
Canva papaya
Aloesia macrochiza
Hibiscus rosa-sinensis
Codiaeum variegatum
Caryota urens
Tectona grandis
Roystonia olivacea
Euphorbia pulcherrima
Canva hybrid
Hibiscus hybrid
Plumeria rubra
Roystonia regia
Ficus microcarpa
Caladium bicolor
Cyperus deventer

Persea indica
Alpinia purpurata
Dieffenbachia (spotted)
Chrysalydodactylus lutescens
Scindapsus aureus
Cyperus circinalis
Plumeria obtusa
Seterasia purpurea
Calophyllum inophyllum
Ricinus communis
Rhoeo spathacea
Cassia spectabilis
Russelia equisetiformis
Caludorica palmata
Peltophorum ferrugineum
Alpinia nutans
Catharanthus roseus
Polyscias guilfoylei
Muraya paniculata
Livistona chinensis
Ilex (misc. with large lvs.)
Ipomoea fistulosa
Sansevieria guineensis
Eleusine indica
Shroobolus africanus
Delonix regia
Ravenala madagascariensis
Caesalpinia pulcherrima
Quisqualis indica
Indica sebastena
Bougainvillea spectabilis?
Euphorbia spathulata
Brathodes campanulata
Dracaena draco?

Polyscias guilfoylei
Saccharum spontaneum
Andropogon glomeratus
Acalypha hispida

Oct. 18 - Panama to Bogotá
via Medellín by Constellation
at night

2:17 Took off - out over Pacific, followed
coast but well out.

2:31 Very complicated ~~coastline~~
coastline with many
Pearl short sandy beaches -
Islands Vegetation a patchwork of
shifting agriculture. A large
island well out from coast,
many tiny ones between, with
some small muddy estuaries,
or sandy, perhaps. No reefs.

2:46 Small airstrip on end of a
hooked peninsula which points
southeast.

2:57 over water again.

3:00 - Occasional glimpses of
dense forest, and of the
coast in the distance
to the right, through deep
cumulus clouds.

3:05 Gradually leaving coast.
Clouds thin out - Forest
below unbroken, streams
deeply incised.

3:06 A few clearings ^{and a cleared strip}
~~muddy~~ ^{along a small} ~~giving~~
that crosses course,
also along a tributary - these
streams run east.

3:09 Then more unbroken forest
More scattered clearings and

3:10 narrow cleared strips along
small streams.

A lake with black water,
surrounded by marsh, a
course, and a meandering strip
of green extending south from
the lake in the forest. Then
another larger lake, also
surrounded by marsh.
Then a large very muddy
meandering river (R. Atrato) ^{angling to it} with many
large black lakes to right
of it and a whole series
to the left of it, between
it and a meandering similar
tributary flowing south
and joining it. More
lakes to east of this
tributary - much of country
here seems inundated,
mostly with black, rather
than muddy water.

Then forest, then
heavy clouds.

3:25

A very deep valley in rugged
mts. and some other deep valleys
fanning down into it.
The high ridges wooded,
slopes denuded.

3:27

To south tremendous
complicated mountains
with many very deep
valleys with steep cleared

3:30

sides, very little wood left - a few tiny patches on highest ridges. This mass of mts. is very extensive - culminates in a very high peak far to south - Paramo de Frontino? Rio Cauca - large, very muddy, a little sparse wood high on ~~the~~ the denuded slopes east of it. Most of the landscape grassy, with some bits of wood in the ravines.

3:33

Passed a peak that almost scraped the plane. Some woods on high ridges. Mostly grassy.

3:34

Valley with long factory-like buildings.

3:35

Medellin. Hills green, with some red erosion scars. Wooded ravines. Banana patches, haciendas, on low hilly land around city. Circling in to airport. River & tributaries channelized. Citrus groves.

3:38

Landed ~~at~~

Plants

Euphorbia tirucalli
Hibiscus schizopetalus
Monstera deliciosa
Cattleya trianae
Euphorbia pulcherrima

4:31

Left Medellin

Slopes to right - ~~west~~ east, partly grassy, partly brushy. bits of woods near tops. Brush more continuous near tops. New construction in Medellin seems unusually ugly from air - long shed-like row-houses.

Lower slopes on west side of valley are seriously eroded and bare, at least ~~below~~ down stream from city.

Coming out over east rim, barely brushed over the ridges.

Then hills almost entirely denuded. Flat bottoms of ravines cultivated, hills grassy or brushy.

4:40

Then a broad cultivated valley with a tightly meandering river (Rio Cauca?).

Gently sloping hilly land rising southward mostly cultivated. To rough small mountains. Visibility poor.

5:00

Rio Magdalena - muddy. Hills generally green.

Sweeping slopes, up from Magdalena to the mountain rim of the savanna.

1962 Columbus

Inside this rim are several
quarry low ridges that are pitted
with sink-holes, but
do not have much the form
of drain. Then a wooded
range, then the flat, green
cultivated Sabana.

A flooded meandering river,
winds southward through it.
Then another.

Scattered oxbows, some
marshy, some drained by side
canals that go nowhere.

Then a channelized but winding river, not flooded.

An elongate curved lake
north of El Dorado Airport.

Clumps of trees indicate farm houses. Rows are along roads. New farmhouses seem to have no trees, mostly.

2 hours
40 min
p.m.

Oct. 20 - Trip by jet - Bogota - Lima -
Rio - Sao Paulo. Right side forward.

9.45

In the southern part of the Sabana there is considerable bare ground, ~~and~~ apparently result of flooding, and many more windbreaks than in north. Hills around south end are dry and brown, rather than green, as in north. Over the rim, above Pusapayugo green again.

Southward in Magdalena
Drainage, a patchwork of
green and brown - the brown
apparently from bare soil,
result of erosion - principally
in bare slopes - esp in valley
below Colombia, toward Neiva,
seems to be a road now east
from Colombia.

10.00 Clouds for several minutes.

Country to west of ^{San} Magdalena
valley is terribly denuded,
only a few high ridges still wooded.
Cloud Ravines have secondary wood.

1003

10:12

solid for a great distance.
Inter Andean Valley ? or Pato region?
Large meandering river, so
must be Pato region and
Patia V.

Agave patchwork, almost
entirely cultivated. Sea in
distance to west, with a
very large estuary - must
be Panama.

(0:1) 7

Mountains as yet mostly
very well wooded. locally
much shifting agriculture
but still much forest.
and good forest extending
most of way to sea.

10:19

High wooded peak, extending
through clouds - apparently
Pichincha.
Vast forest southwest of it;

To a large meandering river.
Broken clouds so no good
idea of the terrain is possible.

10:24

The western Cordillera of
Ecuador, so far as can be
seen, has much good
forest left, though the inner
slope is being cut very
rapidly.

10:25

Intirely cloudy.

10:28

Mountains entirely wooded
seen through holes in clouds
Some shifting agriculture,
some forest. Southward
considerable forest.

10:30

Clouds

10:40

Very rough country, $\frac{2}{3}$ - $\frac{3}{4}$
denuded, esp. on steep slope.
Southward more denuded,
some hills in middle
distance appear rather
dry grassy.

Mostly clouds.

10:44

Mts in distance to west appear
well wooded, much less
so closer to course.

Generally cloudy.

10:46

Mts. mostly denuded along
course. Clouds as far as
we can see to west.

10:49

Hills in clouds - wooded hills
with conspicuous white trees,
a road trending east.

10:53

Wooded hills with
scattered clearings.
Solid clouds.

11:03

Clouds thinning out - relief
seems to be rather minor.
General aspect seems to be
dry and brown, with minor
wooded patches and green
areas, a large closely meandering
river, cultivation locally,
not at all obvious where thin.

11:07

08

Clouds

11:09

Coast in distance, and a
strong turn to left, then
a tremendous estuary lined
with mangroves and
side with mangrove-lined
channels, bare brown
areas back of mangroves
are very extensive. North
of this estuary a point
reaches far to west, estuary
transverse to course after
turn.

11:11

Clouds extending far to
sea. Must have
been mouth of Guayas.

11:19

Brown hills with green
valleys, this extending
some distance to right.

Mostly cloudy.

11:20

A winding road over brown
hills. Country quite rough,
Very little wood except in ravines.

11:22

Very rough dry country,
deep canyons.

We are far inland as hills
can be seen far to right.

Mostly cloudy.

11:30

a valley with considerable
settlement, surrounded by
mostly denuded hills, brown
with greenish ravines.

11:35

Dense clouds.

11:40

breaks in clouds show rather
dry hills. but with some

scraps of woods, more in areas.

11:54

hole in clouds - shows
upland hilly country
draining west, mostly
puna type grassland.

11:59

more puna, sloping
westward, no woods. Very
serious erosion on certain
ridges. Coastal desert
visible beyond several
ridges in distance. Great
gravel washer in mouth
of valley leading down to
coast.

Cruze comes closer to
coast. Hills are very rough
and completely treeless.

Valley bottoms are
cultivated as they become
wide enough.

Some of hills are slightly
brushy.

12:00

Trees in valleys which
show a pattern of cult. fields
and hedges (or ditches). Coastal
flats very sandy. Large river valley.
A number of bare islets
and a forked peninsula on
coast.

12:01

Clouds, then another coastal
area that is mostly sandy.
Hills away from coast are
brown. A few ravines
show gallery wood, but
most show gray streak
in bottom that must
be gravel.

12:03

clouds.

12:04

Hills approach very closely
the coast, but a flood
valley behind first
range. A river valley
leading down to it
has a braided pattern,
considerable vegetation
in bottom, some cultivation.
fields green, hills brown.

12:05

Desert hills with
some open scrub in
flatter ravine beds.

12:06

then complex valley
systems in desert
hills, with pale sandy
bottoms, major washes
with sparse scrub.
Visibility poor.

12:03

A very extensive system of flat sandy or gravelly washes leading toward coast, looking like rivers of sand - lower courses have some vegetation.

There do not appear to have ~~an~~ an entirely logical drainage pattern - perhaps some filling with sand.

12:09

12:12

Clouds.

Descending toward Lima - gamma is complete.

12:26

Small islands off coast completely lacking any visible vegetation.

12:34

Landed in Lima.

The city has built up practically to the edge of the sea cliffs south of airport. This cliff is a remarkably straight one - no vegetation at all.

Nearer airport are green truck farms. A braided stream with some water in its channels.

The landscape around airport is more or less dominated by trees - planted, of course. Largely Eucalyptus, some *Salix chilensis*.

2:00

Took off from Lima airport.

Fields to north green to base. Hills appear very bare. They have some darkening near tops, probably due to Tillandsia. Circled out over Pacific and back ~~westward~~ ^{toward} east.

Large island off coast is bare, as hills on mainland.

2:03

~~crossed coast~~ but started south ^{east} along coast.

2:18

Crossed the coast a bit north of Pisco - a broad beach near of Tambo de Muna. Dry looking cultivation in Pisco area. Peninsula Paracas looks completely bare, light tawny color.

2:20

completely cloudy for a moment. Then country back of Peruvian Paracas - some small farms, apparently struggling against the sand. The rest of this entire area south of Pisco is desert, largely sandy, no vegetation visible. Vast belts of dunes. Areas of barhans, oriented with horns about parallel to coast - southeast.

2:24

A flat agricultural area. Visibility poor.

2:26

Then low desert mountains with

sandy areas between them
clouds.

2:34 a hole in the clouds showed
dry low hilly, very eroded
country.

2:39 Another hole, for a night -
brown hills.

Clouds, continuously
3:58 Passed edge of cloud
at great altitude -
An extremely rugged
mountain mass.

4:01 Crossed a very broad
very sandy river
bed transverse to course.
General vegetation
not at all clear,
but probably forest.
The altitude is
extreme and the
haziness such
that details are not
at all visible.

4:05 Another broad muddy
a sandy river bed
in distance, transverse
to course, but starting
abruptly from a very
narrow one which
is not even visible
in near or middle distance.
General terrain seems
flat.

4:07 a couple of times but

rather abrupt mountain
masses in middle distance.
4:20 Crossed at an angle a
series of low ridges. a lake(?)
in the distance.

Altitude too great and
haziness too great to discern
any details.

4:35 A meandering river running
off to a bit forward of
transverse to course, but
crosses course at an
angle backward.
Dim, but looks like
savanna country.

1962 Brazil

Oct. 21 Sao Paulo -

Instituto de Botanica

120 acres of practically
untouched forest to be
preserved.

Complete rather smooth
canopy - trees small,
up to 30 m. maximum diam dbh
maximum.

Road to Santos -

Low hills covered with
second growth largely
Tibouchina, around
big reservoir - this is
a dense scrub or scrub
forest 4-10 m.

Chusquea, *Bumelia*,
Cyathea

Some marshy areas.

Toward sea the forest
becomes more scrubby, some
grassy.

Then on the break-off,
the relief is great and
there are deep canyons cut
in the granite, densely
covered with a low forest -
would be called montane
rain forest.

Plants seen - Sao Paulo

*Eucalyptus robusta**E. saligna**Grevillea robusta**Picramnia communis**Cytisus scoparius**Ficus pumila**Asclepias curassavica**Musa nana**Musa sapientum**Melissis minutiflora**Rubus rosaefolius**Lambium mexicanum**Cocos nucifera**Codiaeum variegatum**Hibiscus tiliaceus**Terminalia catappa**Cycas circinalis**Delonix regia**Carica papaya**Psidium guajava**Persea americana**Chrysanthemum lutescens**Cordyline ~~allamanda~~ ^{lutea}**Polystichum guilfoylei**Hemerocallis fulva**Acalypha wilkesiana**Sansevieria guineensis**Althaea**Malvaviscus arboreus**Phoenix roebelinii**Livistona chinensis**Rapanea regia**R. oleracea*

Country rock is generally granite.

At foot of range is an extensive mangrove swamp, with winding channels.

On lower slopes the forest is scrubby, largely *Melastomaceae*, *Veronica* sp. in fruit, is a ~~very~~ conspicuous component. The white papery making the trees stand out, in places even dominant. *Cecropia* common.

In mangrove swamp -
Acrostichum aureum
Hibiscus tiliaceo

Escarpment in front of Cerro de Mar, about 900 m. Wooded except some lower slopes which have shifting agriculture, some *Gliricidia*, bananas.

Plants (ctd)

Ravenala madagascariensis
Thunbergia grandiflora
Colocasia esculenta
Nerium oleander
U. indica
Cassia stricta
Chorisia speciosa
Dracaena fragrans
Ficus microcarpa
Kalanchoe verticillata
Strelitzia (other sp.)
Ascalypha "marginata"
Archontophoenix alexandria
Philodendron bipinnatifidum
Euphorbia "splendens"
Hibiscus hybrid
Datura stramonium
Leonurus sibiricus?
Musa "cozinea"
Plumeria rubra
Rhododendron ^(azalea) *indicum*
Quercus elephantipes?
Tricholoma rosea
Plumbago auriculata
Salix babylonica
Agave sisalana
Filum longiflorum (?)
Richardia brasiliensis
Tropaeolum majus
~~Gossyp~~
Gossypia gossypifolia (alt)
Cynodon dactylon
Cardamine hirsuta

Sonchus oleraceus
Pteris vittata
Phoenix canariensis
Arecastum romanzoffianum
Alpinia nutans
Jacaranda acutifolia
Araucaria excelsa
Dahlia variabilis
Nerium oleander
Coffea arabica
Salvia splendens
Ipomoea cairica
Cyperus kyllingia
Tricholena rosea
Tipuana tipu? (com. str. in)
Cupressus sempervirens
Ficus carica
Lobularia maritima
Xanthoxoma violacea
Washingtonia filifera (slender)
Parthenium hysterophorum
Hibiscus syriacus
Solanum lycopersicum
Galinsoga parviflora

Sotaria palmifolia
Tamarindus indicus
Hedyclium coronarium?
Lonicera japonica
Prunus persica
Euphorbia tirucalli
Cyperus rotundus
Ficus elastica

Oct. 27 - Trip Sao Paulo - Emas

Just outside Sao Paulo toward Jundiaí an irregular mosaic of "capoeira", second-growth scrub or scrub forest - marked by Cecropia, open ~~field~~ fields, Eucalyptus forest, etc.

Around Cerrado Paragua is a little original forest, and some capoeira on rough ground.

Just beyond this, but still in hilly, Eucalyptus plantations dominate (several photos). Melinis abundant in open areas.

Weeds - *Cynodon dactylon*
Leucaena glauca
Melinis minutiflora
Pteridium aquilinum

This extends for some distance with only a few small patches of capoeira. This pattern extends to Jundiaí.

Beyond this grape and fig culture, in small farms, forming a mosaic with Eucalyptus.

Locally a clumpy introduced bamboo in low areas. A very few coffee plantations, not shaded.

Country becomes ~~much~~ more open near Campinas.

On drastically eroded areas clumps of Aristida halimifolia are conspicuous, and indicate extreme degradation. Not eaten by cattle. Large termite mounds. Typha marshes in low areas.

Mun. de Sumaré.

Beyond here country becomes very open.

Much pasture, large fields. Rolling land. Americans.

Sugar cane. Cider. Mostly pasture. A little Eucalyptus but irregularly scattered. Bushy ravines.

A few scattered *Coumouma* exudes.

More and more orange groves and Eucalyptus plantation toward Pima. Some sugar cane.

This increases until, to the left of highway it dominates landscape. Very dark red-brown soil, from weathering of basalt. Deep. Not at all rocky. (Araras 16 km.) ~~from Pima~~

Some patches of fairly good secondary forest. Very. Whole area was formerly coffee.

Then large open area
much sugar cane, some
~~fazenda~~ ~~the~~ pasture.

Some small areas of *Aleuteria*
fordii. Pasture with clumps
and patches of *Eucalyptus*.
Some

Large *Eucalyptus* plantation.
More open country some
range groves, patches of
second growth. Becoming
stems in fences. Scattered
Acrocomia sclerocarpa.

Rolling land. Quite a
few palms. Woods in
ravines and low spots.

Some *Eucalyptus*

Poste Santa Cruz.

Appr. *Pinassumungha*.

Croton (tree) abundant
locally in low areas.

Locally *Piptadenia colubrina*.

~~Ris~~ *Emilia* sp. on roadside

Pinassumungha. (Act on Cerrado)

Mangifera indica

Cycas circinalis.

Large orange groves. Bamboo
in low areas.

Toward Cachoeira

Poor Cerrado - burned
relatively recently. Varied
in stature.

Cachoeira - Emas

Ficus microcarpa in
streets, mangos.

Rio Mogiguaru. has
many species of fish,
some very good.

Phyllodendron bipinnatifidum
Allamanda cathartica
Terminalia catappa
Citrullus vulgaris

600 m. Campo Cerrado near
Emas -

This area has on one
side of road a protected
tract belonging to the
University, not burned
for 15-20 years. On other
side not protected -
(photos of both, b.w. & col.)

The protected part
is an open to closed
scrub to scrub-forest,
general level ~~4-6~~ 4-6 m.
but emergents to 10 m.
generally mesophyllous
to microphyllous,
bark on most species
thick and ridged,
checked, or broken.
A few macrophyllous
species. Varying from

orthophyllous & sclerophyll.

Badly invaded by
melinis, which forms
a complete ground cover,
up to 1 m. deep.

Soil a pinkish brown
fine loamy sand.

Much dug up by
armadillos.

Thick bark - Swertia

On other side of road
where there has been
burning - grass is
lower, perhaps 0.4 m.
shrubs ~~go to~~ lower,
distribution more open,
varying to nearly closed,
varying to ~~for~~ open
scrub forest, on this
side of road mostly
mesophyllous.

This is more typical
as far as aspect is concerned,
as the

Sao Paulo (under Pl. of Brazil)

Oct. 27 - near Pirassurunga
roadside in red soil
in cutover "campo cerrado".

43289 *Emilia javanica* (Burm. f.) Rob.

Forest near Cachoeira
is a closed forest
about 14-20 m tall
with a few trees
up to 4-5 dm dbh, which
are emergent, others 1-2 dm
dbh, 2-3 m, spaced,
some small saplings
between them. an ^{open} shrub
layer 1.5-2 m, tall

prof. from Emira

no

~~444301~~

1962

check locality in book
ask Eiten if same place

no coll. by P. Teixeira

Bygonima

but not cleared.

Mun. Pirassurunga

flowers red.

Byssonima

no coll. by Mrs Teixeira

check locality in book

ask Eiten if someone else's

no ~~443301~~ 1962

prob. from Ennas

orthophyllous & sclerophyll.

Badly invaded by
melinis, which forms
a complete ground cover,
up to 1 m. deep.

Soil a pinkish brown
fine loamy sand.

Much dug up by
armadillos.

Thick bark - *Swetia*

On other side of road
where there has been
burning - grass is
lower, perhaps 0.4 m.
shrubs ~~of~~ lower,
distribution more open,
varying to nearly closed,
varying to ~~for~~ open
scrub forest, on this
side of road mostly
mesophyllous.

This is more typical
as far as aspect is concerned,
as the

Sao Paulo (under Pl. of Brazil)

Oct. 27 - near Pirassurunga
roadside in red soil
in cutover "campo cerrado".

43289 *Emilia javanica* (Burm. f.) Rob.

Forest nearer Cachoeira
is a closed forest
about 10-20 m tall
with a few trees
up to 4-5 dm dbh, which
are emergent. others 1-2 dm
dbh. 2-3 m. spaced,
some small saplings
between them. ^{open} shrub
layer 1.5-2 m. tall
very slight herb layer,
mostly seedlings.
Shrub layer mostly
Myrsine.

Lianas common.
Epiphytes not plentiful.
Adjacent to this is
an area where it has
been cleared except
a few scattered trees.
Her cerrado plants
have come in. Small
because of grazing.
Forest is grazed, too.

Forest is probably one
that has been degraded
but not cleared.

Mun. Pirassurunga

flowers red.

Oct. 27 - Emas, near
Cachoeira, ^{Mun.} Mundo Pisassurunga
^{Campo} in ^{Cerrado} campo cerrado vegetation,
badly invaded by Melinis.

43290 *Randia?*

4 occasional

6 91 (leg.) *Connarus fulvus* Planch.
~~at~~ rare3 92 (comp.)
occasional2 93 *Stylosanthes guianensis* (Aubl.) Sw.
local3 94
occasional1 95 *Tabebuia?* *Zeyheria digitalis* (Vell.) Hoehne ^{det. A. Gentry}
rare, one plant seen 19743 96 *Randia*
occasional1 97
rare1 98 (anlep.) *Blepharodon lineare* (DC.) det. Spellman
rare 19783 99 *Adiantum*
common locally43300
3 rare1 01
rare1 02
rare3 03 *Wedelia?*
occasional1 04 *Aristida pallens*
common locally on rather bare soil

open scrub or scrub forest

Piracicaba

shrub 1.5 m. tall, buds
not open.shrub 1.5 m. tall,
pods inflated.
marginal flowers tubular,
purple.
erect~~shrub~~ shrub 1.5 m. tall,
fruit fleshy, red.
slender unbranched
shrub, 1.5 m. tall.
shrub 1 m. tall,
flowers dull yellow.
leafless shrub.Spellman
1978erect, milky; flowers
green, crowns white.
rhizome buried, fronds
erect.~~small~~ tree; flowers
greenish.

shrub 1 m. tall;

fruits green.
low shrub, fruit green.

flowers bright yellow

clumps

- 43305 *Spermacoce*
occasional
- 2 06 *Gomphrena macrostigma* Mart.
common in trails
- 4 07 (malp.)
common
~~08~~
~~occasional~~
- 3 08 *o*
occasional
- 3 09 *Caryocar*
occasional
- 3 10 *Smilax*
occasional
- 1 11 (malp.)
occasional
- 2 12 gesner.
occasional
- 1 13 *Stevia*?
rare
- 3 14 *Miconia albicans* (Sw.) Triana (det. Wurdack
(1968))
common
- 4 15 *Eugenia*
common
- 3 16 *Eugenia*
occasional
- 3 17 (Munieria?)
occasional
- 1 18 *Didymopanax*
rare
- 2 19 *Erythroxylon*^{um} tortuosum Mart. det.
Blowman 1983.
occasional

erect, flowers white.

root enlarged; heads white

shrub 2 m. tall (others
seen much taller) petals
pink

small shrub

shrub 2 m. tall,
just past flowering.
— twining in bushes,
fruit very young.

— semi-scandent shrub
several m. long, fls. yellow.
— erect from buried
tuber, flowers with
calyx and corolla
deep orange.
— erect, flowers dull

shrub 2 m. tall,
— leaves deep green above.

shrub 1 m. tall,
— flowers white.

shrub 1.5 m. tall,
— ~~fls~~ fruits immature.

— shrub 2 m. tall,
fruit immature
— sparsely branched

— shrub 2.5 m. tall,
shrub, bark very thick,
leaves glaucous

43320 *Styrax floribunda* ?
occasional

3 21

occasional

4 22

occasional

2 23 (figs.) *Distictella elongata* (Vahl) Urb. (s.l. to include
D. mansonii) det. A. Gentry 1974
rare

1 24 (quadr.)

occasional

3 25 *Eugenia*

occasional

3 26 *Aegiphila paraguayensis* Briq. det. H. N. Moldenke 1974
occasional on roadside

5 27 *Acanthospermum*
common on roadside sand

Oct. 28, 1 km. n.w. of Campo Grande
railway station, Mun. de Ribeirão
in open grassy bog

1 28 *Polygala rubraefolia* Chod. ex Grandon
common in wetter areas

2 29 *Paepalanthus* ? *Leiothrix stanscens* (Bong.) Ruhl.
common locally

2 30 *Paepalanthus planifolius* (Bong.) Körn det.
common

→ *Paepalanthus planifolius* var. *villosus* Moldenke det. Moldenke Nov. 1974

4 31 *Paepalanthus* *Syngonanthus caulescens* (Poir.)
Ruhl. det. H. N. Moldenke 1974
occasional, on mineral soil bank

3 32 *Cladium*
abundant, dominant locally

shrub 1.5 m. tall,
bud only.

shrub 1.5 m. tall;
fruit very immature.

shrub 2 m. tall,
branches ascending
rather strictly.

climber, flowers white.

tree 5 m. tall, branches
fleshy.

shrub 2 m. tall,
fruits immature.

depressed shrub; flowers
whitish.

prostrate, spreading
from central root crown,
extensively branching,
heads whitish.

Mun. de Ribeirão Pires

erect, flowers reddish purple
rosette with wintergreen odor.

det. Moldenke Nov. '74

Moldenke Nov. '74

large rosette, with
a stem some cm. long
but mostly down in peat.

large rosette, heads
almost globose.

erect, not especially
caespitose.

Oct. 20 - Cerrado near
~~Graciosa~~ 7, mile Rm. on rd
 m. to ~~Campo~~ Grande
 grazed bog in lawn
 surrounded by low
 hills.

Ground rather irregular
 cut up by trapline
 partly open, grassy
 with patches of an
 erect *Cladium*.

patches of small, very
 spring *Cyathea* about
 1 m. tall, *Blechnum* sp.
 (one with red young growth,
 one without) scattered
 irregularly, as are
Paepalanthus sp. &
Eriocaulon sp. (?)

small shrub thickets 1-3 m.
 tall in low spots.

Melastomaceae common.
 Wing stemmed *Baccharis*.
 a beautiful distichous
 leaved, scapose, indehiscent
 plant with blue flowers.
Sphagnum & *Drosera*
 ab.

Oct. 28 - Estacion Biologica,
 Serra do Moji, Paranaipiacaba,
 above Santos, n.w. Sao Paulo -
 about 1 hour + drive from Sao Paulo
 over dirt roads through the
 low hills of the coastal
 range. Much industry here.
 A large marsh at
 probably included in the water
 reserve, so may be protected.
 The hills become partially
 wooded with a scrub ~~of~~ or
 scrub forest, partly clear.
 basins between are bogs.

from Paranaipiacaba station,
 on the railroad it is 15 min. + walk
 up to the station (biologica), which
 is on top of a hill surrounded
 by a typical montane scrub forest.
 Santos is visible on a clear day;
 below. But clear days are said
 to be few. The southeast trades
 hit the escarpment and are
 pushed up. The range here is
 between 700 + 1000 m. + high,
 and the rain at the station
 is over 2500 mm. annually.
 Cloudiness is frequent and
 drizzly rain prevalent.

The entire reserve, of 740 acres ±
 is wooded. It is deeply dissected
 into ridges and canyons, with
 many streams. In several places
 there is a divide between the
 (to p. 74)

Oct. 28 - Serra do Moji,

^{1/2 to 1 km W. of} ~~near~~ Paranapiacaba,
above Santos, Mun. de Santo André
in ~~a~~ montane rain-forest,

43333 *Peperomia*1
3 34 sub.

occasional on scrubby ridge

1 35 apoc

rare on scrubby ridge

36 *Utricularia*common, on ground and in
bromeliad rosettes on wet
scrubby ridge1 37 *Sisyrinchium*

in open trail on wet ridge

3 38 *Hedyosmum*

occasional on wet scrubby ridge

1 39

rare on wet scrubby ridge

5 40 (myrt?)

rare on wet scrubby ridge

4 41 (melast.) *Leandra collina* Wurdack (paratype)in ~~scrub~~ on wet ridge, low forest,1 42 *Pteris*

in open spot on wet ridge

3 43 (myrt?)

on wet scrubby ridge

2 44 *Pleurostachys*very common in semi-open
places and along trail on
wet scrubby ridge3 45 *Selaginella*common on wet cut bank ^{above trail} in canyons760-840 m. "Alto de Serra" Pm. de
Ribeirão Pires

not particularly fleshy

shrub 4 m. tall,

— fruit immature.

— twining liana,

— flower white.

rhizome ^{white} fleshy, brittle,
deep in moss; flowers
violet ~~to~~ bright lavender
with yellow stripes on ridges of ^{with small} lobes.

— bud yellow; fruit
green; leaves distichous.

— shrub 1.5 m. tall,

— aromatic when broken.

— shrub

small tree 5 m. tall;

— buds white

— shrub 2 m. tall, slender;

— flowers white.

~~erect~~ fertile fronds
erect, sterile spreading.

— shrub 2 m. tall, ^{dark} green above, pale beneath.

— stems decumbent to

— ascending, leaves

conspicuously 3-ranked.

plants somewhat stiff

- 43346 *Hymenophyllum*
abundant on leaning tree trunk
- 3 47 *Trichomanes rigidum* Sw. det. Sellinger 1978
very local on steep bank
in canyon
- 1 48 *Cochlidium serrulatum* (Sw.) L.E. Bishop det. Sellinger 1978
rare, on mossy rocky bank
in canyon
- 4 49 *Grammitis*
common, abundant on
tree trunks
- 1 50 *Asplenium monanthes* L. det. Sellinger,
occasional
- 1 51 *Asplenium polyphyllum* Bertol. det.
rare on tree trunk
- 1 52 (melast.) *Salpinga margaritacea* (Nard.) Triana
occasional on cut bank above
trail in canyon
- 3 53 *Vaccinium*
rare in undergrowth
in deep canyon
- 4 54 (melast.) *Leandra quinque dentata* (DC.) Cogn. (det. Wurdack 1968)
rare in undergrowth in
deep canyon
- 3 55 *Elaphoglossum*
on bank along trail in canyon
- 5 56 *Trichomanes*
abundant on tree trunk
- 2 57 *Hymenophyllum*
common on tree trunks
- 3 58 *Hymenophyllum*
on tree trunks *polyanthos* (Sw.) Sw.

- fronds pendent.
- 1978 small sterile tree,
4 m. tall
- Sellinger, 1978
(det. Wurdack (1968))
leaves dark green above
with 2 rows of white
spots, purple beneath,
scape erect.
- sprawling shrub
2 m. tall, corolla white,
5-angled.
- shrub 2 m. tall, flowers
white; fruit immature.
- erect

4 43359 *Hymenophyllum polyanthos* (Sw.) Sw. det. Sellinger, 1978
 1 on small tree trunk

1 60 *Hymenophyllum* cf. *polyanthos* (Sw.) Sw. det. Sellinger, 1978
 on tree fern trunk

1 61 (lobell)
 on scrubby slope

2 62 (gerani)
 common on scrubby ridge

3 63 *Sterea*?
 rare on scrubby ridge

1 64 *Scleria panicoides* Kunth det. Strong, 1968
 rare on scrubby ridge

3 65 *Byrsonima intermedia* Tuss.?
 rare on scrubby slope

4 66 (legum.)
 occasional on scrubby ridge

3 67
 abundant on earth banks
 in canyon

twining in bushes,
 corolla compressed,
 rose pink.
 scrambler, leaves
 fleshy, corolla bright orange,
 strongly gibbous, calyx
 alate.
 twiner,

erect.

shrub, fruits immature

small tree 4 m. tall,
 stamens white.

(from p. 67) Parana and Atlantic drainages.

On ridges the forest is low and scrubby, in places very dense, generally unistratified except for a thick ground cover of Bromeliads and ferns. This tending to be thinner away from trails. In some places where ridges are wider, or where there are flat areas, the vegetation becomes more scrubby and tends to be more open, with much *Pleurostachys*.

In the ravines the forest becomes much taller, up to 20-25 (or even 30) m. tall, with trees perhaps 4-5 dm dbh. canopy complete.

Epiphytes are plentiful, especially orchids and bromeliads, also *Hymenophyllum*, other ferns, mosses, etc.

more so in the deep ravine than on exposed ridges.

However, they are not or scarcely plentiful enough so that this could be designated mossy forest or cloud forest.

Trunks not swollen with masses of hepatics and mosses. *Favosites* mosses not abundant.

Simulium
(not seen)

Certain Andean elements are notable in the flora - *Weinmannia*, *Fuchsia*, *Hedyosmum*, *Hillia parviflora*.

Melastomaceae common but scarcely abundant.

Rubiaceae surprisingly infrequent.

Some lianas - *Smilax*, *Aporosa* with white fls., *Stevia* (?). various aroids. Aroids and ferns with stems clinging close to tree trunks seem very frequent.

Utricularia cf. *humboldtiana*, somewhat common along edge of forest along trail on side above railroad - has rhizomes deep in moss and ferns or even in bromeliad tanks. Rhizome is white, fleshy, has root-like slender much branched branches that bear traps, tiny white ones.

The reserve is criss crossed by a network of graded trails, which on slopes have steps made by putting in small logs. Fleshy fungi are common on these.

The soil is a mixture of clay, silt, & very fine sand. It is pale yellowish to white, very thin on ridges, where rocks are exposed.

1962 Brazil

Oct. 29 - Rio de Janeiro

plants seen

*Hibiscus tiliaceus**Terminalia catappa* (common str. tree)*Rorystonea oleracea**Agave sisalana* (variegated)*Ficus elastica**Ficus "grandurata"**Codiaeum variegatum**Cordyline fruticosa**Sivistora chinensis**Xanthosoma violacea**Cyperus papyrus**Eichhornia crassipes**Arecastum romanoffianum* ^{com. str.}*Peltophorum ferrugineum**Cocos nucifera**Bumelapue aureus**Phyllodendron bipinnatifidum**Nicotiana glauca**Setcreasea purpurea**Pandanus dubia?**P. tectorius?**Malvastrum**Sansevieria guineensis**Galinsoga parviflora**Eleusine indica**Caryota urens**Mangifera indica**Dracaena fragrans**Monstera deliciosa**Xanthosoma sagittifolium**Canna lily**Euphorbia pulcherrima*1. *variegata**Plumieria rubra**7. Humboldtia grandiflora**Pontederia cordata**Ficus microcarpa**Clitoria**Ipomoea fistulosa**Delonix regia**Ravenala madagascariensis**Cyperus rotundus**Phyllanthus amarus**Laccosolepis indica?**Mogoulia tomentosa* (Rox.) Oishi*Artocarpus altilis**Impatiens sulcata**Cynodon dactylon**Calyptra welbesiana**Humboldtia alata**Ficus pumila**Cassipouira striata**Polypodium guilfoylei**Artocarpus heterophyllus**Plumbago auriculata**Panicum mesicium**Ipomoea campanulata**Monarda charantia**Psidium guajava**Lechinus* (amaru)*Wedelia trilobata**Sida rhombifolia**Sida acuta**Ipomoea carnea**Urena lobata**Mimosa pudica**Bomarea verticillata*

Nov. 2 - Auto trip in Guanabara.

fourth coast - steep and rocky between broad beaches. Granite slopes at base of cliffs covered by scrubby thickets. Steep slopes bare except for crevices & ledges which have herbaceous plants.

In and around Quinta da Impropria Lenna & Azolla. (photo of V. da Gavea)

Around Gavea Golf Club steep wooded slopes - scattered white Cecropia. A few houses & even apt. houses on these slopes, with streets climbing to them. The soil on the lower slopes red.

Cross saddle to Barra Tijuca

Large sand flat or restinga - mostly built up. A lagoon and mangrove swamp, with restinga between parts of this. Forest on restinga largely Eugenia sp. communis. Some Cecropia. Hibiscus tiliaceus shrubs. Cordia sp., Vernonia. A small spiny palm: clumps, leaves very spiny, trunk also.

This palm is bitter not eaten. Some guava, and a shrub with broad oval lvs. & hooked tendrils. Persea.

Low spots have black peaty sand, are dominated by Eugenia. Little undergrowth. Many mosquitoes.

Along margins of sand what appears to be a Blackberry in sand. Young lvs. reddish. lvs. erect.

Acrostichum aureum common in wetter places and in swamps.

Agave sp. (glaucescens) very common on sand.

Typha marshes, Bladum marshes common.

Recreio dos Bandeirantes

Tijuca Restinga broad sand flat, with very low dunes just back of beach. These rather blown out (photos), with a low irregular scrubby veg, where sand is fresh. Ordinary psammophytes just back of beach a strip of scrub of Siphonanthus maritimum up to 1 m. tall. (photos)

Trumpetta bartramia
"archigo"

Richardia

"picao de praga"
Schinus terebinthifolius?

Eragrostis ciliaris

Sporobolus caprap

Euphorbia hirta

Remirea maritima

Stenotaphrum secundatum

Richardia brasiliensis

Nicholaena rosea

Canavalia rosea

Sporobolus virginicus

Erechtites valerianifolia

Agapanthus africanus

Caryota mitis

Cycas circinalis

Allamanda cath. v. serg.

Cassia fistula

Tibouchina semidecandra

Grevillea robusta

Cycas revoluta

Bidens pilosa

Emilia sonchifolia

Ruellia equi

all
just
back
of beach

photos

East along this north
shore - the belt of dunes
narrower, but the belt
of palm scrub spreads
down onto the low sand flat
back of the dune. On this
flat a complex mosaic
of sand and marsh
vegetation. Then some
lagoons, lined with
Cladium marsh perhaps
30-5 m. w. Between this
and the dune ridge on which
is the road, palm scrub
with scattered *Cereus*,
Aechmea?, *Tournefortia*,
Eugenia?, *Sapota*,
Euphorbiaceae.

On the beach side of the
road belt of
Sporobolus virginicus,
with a little *Canavalia*,
Sporobolus sp. ^{a few} scattered,
Dipterocarpus.

Eastward along coast
the low palm scrub tends
to give way, bet. road + lagoon
to a dense wind or spray
sheared scrub 2-4 m. tall.

Inland on restinga
behind lagoon is a
Pteridium about 2 m. tall

very much like that
at Adroponome, but fronds
not at all indeterminate.

Panicum maximum
common here in open ground,
with *Trichocereus*.

Some casuarinas of
stricta (*aequisetifolia*?)
planted, called "punheira".

Most of this restinga
covered by a scrub of
scrub forest 4-5 m. tall.
Much *Albizia*, ispingy
palm + *Cecropia*.

Westward this gives
way to a low broadleaf
scrub with many genera
of shrubs - *Euphorbiaceae*,
Compositae, *Croton*, *Cuphea*,
Coccoloba, *Vaccinium*, *Cereus*,
Daphnotherium, *Malpighiaceae*
etc. On white sand.

(photos)

Photos of meadows from beach.

Furnas de Figueira

photos of granite domes

Cassada do Alta do Boa Vista
in Floresta de Figueira
(Photos)

Surrounded by rather
tall montane rain forest
perhaps 20 m. +. very mixed,

trees with umbrella crowns,
many larvae

Belvedere Dona Marta
a high point in the middle
of the horse shoe, with views
in almost 4 directions of
all parts of the city - fully
as high as the Sugar Loaf.

Vegetation on sides of this
a scrub of many composites
Melastome etc.

Climb to Crivada is thru
very viny montane
rain forest on steep slope.
A few tree ferns, *Chusquea*,
Cecropia.

Top all in clouds.

Nov. 2 - Restinga

east of Barro de Tijuca

in low scrub vegetation on sand flat

43363

Vaccinium

5

very common

2

69

(marcapar.)

rare

3

70

Polypodium?

occasional

2

71

Cassia ramosa Vogel

rare

2

72

Croton

occasional

4

73

?

common

2

74

(comp.)

occasional

1

75

Declieuxia tenuiflora (Willd. ex. L. 65.) Steyer.

rare on bare sand

3

76

Diordia

occasional on bare sand

2

77

(matp.) *Marsippos*rare on ~~bar~~

3

78

Borreria

common on sand

Nov. 2 - Restinga de Barro de Tijuca
on ^{low} dune ridge of white quartz
sand just back of beach

4

79

Diplothemium maritimum

acaulescent, leaves spreading

forming a dense scrub
belt just above beach

(under Pt. of Brazil)

shrub up to 1 m. tall.

- corolla deep red, ripe fruit black.

shrub 0.3 m. tall. pedicel

- and bracts red.
rhizome buried, frond erect

low shrub, flowers

- orange, deeper with age
slender shrub 1-1.5 m. tall.

shrub 0.7-1.0 m. tall,

- flowers white.

weak shrub or suffrutescent

- herb, flowers dull white.

plant purplish, flower white.

many stems ^{ascending} from root

- crown, fls. pale lavender

low shrub; flowers very

- bright yellow

flowers white

acaulescent; leaves
spreading glaucous
beneath; inflorescence
erect.

86

1962 Brazil

43380 *Clitoria* ~~*Centrosema*~~ *virginianum* (L.) Benth.
occasional on loose sand

~~81 *Borrichia*~~

4 81 *Borreria*
common on loose sand

3 82 *Hydrocotyle*
very common on open sand

2 83 *Boerhavia*
rare on loose sand

~~84 *Emilia* *sonchifolia*~~

3 84 *Emilia sonchifolia* ?
common on loose sand

same - on sand flats
well away from beach

4 85 *Fimbristylis*
common along edge of
water in channel

2 86 *Paspalum distichum* L.
common

1 87 *Eugenia cumini* ?
dominant in forest on low
~~sandy~~ damp sand.

3 88 *Richardia ~~scabra~~ brasiliensis*
common

Nov. 2 - Gruta de Imprensa

on wet rocks just above sea

3 89 *Lemna*
common

3 90 *Azolla*
abundant on wet rocks

Guanabara
Guanabara

Under
at of Bozjo

87

spreading, forming a
loose mat, from root crown.
flowers lavender
leaves cinereous; flowers white.

rhizomes white, fleshy,
buried; leaves stiff, plain,
blades held vertically.
stems spreading to
ascending

caespitose, erect.

forming loose sod

tree 6 m. tall; flowers
white.

prostrate, extensively
spreading, flowers
white.

Nov. 11 - corner Circumferential
Highway & Braddock Rd.

Rolling land with
deciduous woods 20-30 m.
tall, with a few large
trees - *Quercus coccinea*
Pterodendron.

A scattered tall shrub
layer of *Ilex opaca*, common

Locally some *Pinus virg.*

Several old roadways
across.

Toward Braddock Rd,
Fagus becomes larger,
more abundant. *oaks* less
present, except to west
where are several patches.
and a scattering of large
Pinus rigida.

(red) pretty st.

Rudbeckia laciniata a

Goodyera pubescens a

Tipularia discolor a

Lycopodium obscurum l

Plants - *Pinus serotina* 2

Trees *Quercus macrocarpa* a
Pinus rigida o

c *Pterodendron* c

c *Fagus* c-a

lc *Quercus coccinea* o

c *Quercus alba* c

o *Quercus velutina* o

o *Acer rubrum* (subl.) o

o *Carya* sp. o

o *Fraxinus americana* a

lc *Pinus virginiana* lc

o *Quercus falcata* o

o *Quercus prinus* a

o *Quercus prinus* a

o *Quercus prinus* a

o *Quercus prinus* a

o *Quercus prinus* a

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o *Quercus prinus* a

o *Quercus prinus* a

Labels
written

Nov. 11 - Circumferential Highway
at Braddock Road
in deciduous forest
with *Ilex opaca* understory

43391

Quercus rubra L.

2

rare

1

92

Lycopodium obscurum
small colony

1

93

Goodyera pubescens
rare

1

94

Pyrola rotundifolia v. *americana*
local, under *Fagus* trees

1

95

Mitchella repens L.
abundant

1

96

~~*Tipularia discolor*~~
Aplectrum hyemale
rare

1

97

(ord) *Aplectrum hyemale*
rare

tall tree, leaves yellow
at this season.

leaves more or less in
one plane.

leaves gray-green, veins
white.

creeping; fruit scarlet.

leaves purple beneath.

leaves bronze-purple,
veins white.

Nov. 24 - Sleepy Hollow
 Tripps Run above Sleepy
 Hollow Road bridge.
 Bottom land forest -

- a Liriodendron
- a Quercus alba
- o Quercus palustris
- o Quercus ~~pauciflora~~ coccinea
- ^ Quercus bicolor
- o Acer rubra

Shrub layer 1 - 4 m. tall,
 irregular

- c Prunus serotina
- c Fraxinus americana
- l Rosa multiflora
- lc Ligustrum vulgare
- lc Corylus cf. cornuta
- c Lindera benzoin
- o Viburnum prunifolium
- o V. dentatum
- o la Cypripedium caroliniana

tangled up to about 4 m.
 with Lonicera japonica
 similar Vitis sp.
 some Rhus toxicodendron on
 tree trunks.

Ground covered locally
 by Lonicera japonica
 locally by Glecoma
 some Aster cf. lateriflorus

Canopy irregular
 but mostly complete

Cinna arundinacea,
 Elymus sp.
 Panicum cf. clandestinum

Upstream the forested bottom
 broadens out.

One tree with bark coming
 off in round flakes unidentified.
 Small patch of Pinus
 virginiana on slightly
 higher ground to left.

This adjoins private property
 at back of lots. Has many
 paths - at least 2 pines
 cut down.

Considerable Lonicera japonica
 tangled up to 5 m.

Above this, toward stream,
 Acer rubrum becomes abundant.

Then there is a transverse
 strip where the forest
 has been cut some time
 ago, probably for a band
 of the Tripps Run sewer.

This has some open grass, some *Alnus* scrub, some bush of *Prunus serotina* saplings 3-5 m. tall.

The ground is marshy.

Carex sp.

Lulichium

Arthraxon hispidum

Aster ssp.

Solidago sp.

Above this is a flat of some width covered by a forest of

Acer rubrum

Diospyros virginiana

Quercus palustris

Liriodendron

Mostly rather small - up to 2 dm dbh, occasional much larger trees.

Lonicera much more local here, in places the forest is quite open.

Viburnum dentatum forms clumps.

Much of this area is swampy, some with hummocks of fern roots, etc.

This swampy land has

o *Vaccinium corymbosum*

c *Lindera benzoin*

o *Sambucus canadensis*

o *Fraxinus* sp.

o *Alnus serrulata*

Smilax rotundifolia

a *Cinna arundinacea*

This swampy area is drained by a small stream with dendritic branching system.

Across the more open part of this flat, just downstream from the stream draining the swamp, ~~is~~ a ditch was apparently dug, some time back, which drains the part of the flat toward the houses to the southwest. This apparently keeps the adjacent ground less swampy than it would be otherwise. This

has much *Allium vineale*, locally, and *Glechoma hederacea* on the ground.

Here the *Viburnum dentatum* is most abundant.

Cinna arundinacea is common. Some *Lindera*.

Southeast of this in woods with little undergrowth *Cinna arundinacea* is very abundant, *Agrimonia* common.

Near Tripps run considerable evidence of small boy - chopped fallen trees, paths, etc. Digging on sandy stream terrace.

Lonicera abundant near Tripps Run.

At lower end of the open strip is a swampy area, but a ditch has been dug draining this into Tripps Run.

About halfway to Sleepy Hollow Road a small channel pond has been partly drained by a ditch rather recently dug.

One *Quercus bicolor* tree perhaps ~~15~~ 15 m. from Tripps Run - only one seen. The leaves from it are very conspicuous on ground (heavy wind last night).

These ~~are~~ scattered to Tripps run, about ~~15~~ 15 m. in s.e. direction away from Run, about ~~30~~ 30 m. up stream, perhaps 40 m down stream. Perhaps some measure of influence of one rather small tree - perhaps 15+ m. tall, 25 cm dbh. Much overtopped by surrounding trees.

another ditch has been cut to ~~the~~ Tripps Run just back of lot facing Sleepy Hollow Rd.

Nov. 30 - Stone House, just west
of Bull Run, near Manassas
Battlefield Park

Photos of *Platanus occidentalis*
along small stream in pasture,
with junipers, etc.

Nov. 30 - Wildcat Mt. Preserve

birds - blue jay
crow, vultures

(Mr. Arundell saw grouse
this morning and 20 wild turkeys
yesterday.)

Echinum vulgare still in flower.
Chrysanthemum leucanthemum
Symphoricarpos obiculatus in fruit
Achillea millefolium

Winter rosettes

Oenothera biennis
Chrysanthemum leucanthemum
Achillea millefolium
Antennaria plantaginifolia
Ranunculus sp.
Plantago lanceolata
Fragaria virginiana
Verbascum thapsus
Barbarea vulgaris

Evergreen ferns

Asplenium platyneuron
Polystichum acrostichoides
Polypodium vulgare
Woodsia obtusa
~~*Barbarea*~~

Dec. 3 - Baltimore Parkway
Just before College Park Exit
photos of *Pinus virginiana*
forest

2.5 mi. before Beltsville Exit
photos of mixed deciduous
woods with *Acer rubrum*,
Liquidambar, oaks, tulip, etc.
1/2 mi. before Beltsville exit
photos of stream-bottom
land forest.

Just beyond first Laurel-Rock
exit - photos of *Betula nigra*
thicket.

Dec. 9 - near Potomac State
Forest - Denton Farm

Harvested soy bean fields
abundant deer tracks.

Deciduous second growth
largely *Liquidambar* up
to 15 m. dbh about 2 m.
spacing 15-20 m. tall,
much *Smilax*.

Erodium cicutarium
abundant in plowed field.

Brownish gray fine sandy
loam soil.

Along edge of field
is a single row of *Pinus*
taeda, then deciduous
forest. At end of row
a patch of *Pinus taeda*.

Birds

White throat

Ruffed grouse

Myrica cerifera (?) abundant
at edge of forest under pines,
less common back in
second growth.

Smilax very abundant
in undergrowth, much of
it bitten off at 2-4 dm.

Magnolia virginiana & *Ilex*
opaca common in undergrowth.
This is very thin second
growth with much
Quercus alba, scattered
Pinus taeda (small), *Quercus*
falcata, *Q. marilandica*,
a little *Fagus grandifolia*
abundant *Gaultheria* on
ground. Some *Desmodium*
This has been logged not
too long ago.

Low ground along small stream

has *Sphagnum*
 Most of *Magnolia* is in
 the low areas. These low
 spots common, even
 away from stream.
Asmundia regalis.

Nex opaca abundant,
 forming an understory
 up to 6-8 m. tall.
 The trees in swamp
 areas have characteristically
 swollen bases. Small
Taxodium common locally
 in swamps. Some *Quercus*
prinus.

Large area of shrub
 swamps, with *Alnus*, *Myrica*,
Rosa palustris, *Acer rubrum* most abundant.
Vaccinium corymbosum: with small *Liquidambar* *Taxodium* scattered.
 Quite a few *Taxodium*
 about 25 m. tall, 3 dm dbh
 with enlarged pitted bases
 abundant knees around
 edge of this.

Considerable open water
 with sedges, *Ludwigia*

Adjacent is rather
 more wooded swamp,
 with *Acer rubrum*, *Liquidambar*
 to 25 ~~cm~~ m. 15 m dbh
 some *Taxodium*, almost

dense understory of *Nex*
 about 3-5 m. tall among
Liquidambar and *Acer* and
 scattered *Pinus taeda*. Much *Rhododendron*.

has *Sphagnum*
 Most of *Magnolia* is in
 the low areas. These low
 spots common, even
 away from stream.
Asmundia repens.

Ilex opaca abundant,
 forming an understory
 up to 6-8 m. tall.
 The trees in swamp
 areas have characteristically
 swollen bases. Small
Taxodium common locally
 in swamps. Some *Quercus*
prinus.

Large area of shrub
 swamp, with *Alnus*, *Myrica*,
Rosa palustris, *Alnus* most abundant.
 with small *Liquidambar* *Taxodium* ^{*Acer rubrum*} scattered.
Vaccinium
crispulosum: Quite a few *Taxodium*
 about 25 m. tall, 3 dm dbh
 with enlarged fluted bases,
 abundant knees around
 edge of this.

Considerable open water
 with sedges, *Ludwigia*

Adjacent is rather
 more wooded swamp,
 with *Acer rubrum* & *Liquidambar*
 to 25 ~~20~~ m. 15 m dbh
 some *Taxodium*, almost

no undergrowth,
 broad flat hummocks
 with dry grass and
 mosses, occasional small
 knolar thickets

many trees have been
 blown down, leaving
 thin dense root platform
 standing on edge.

Water flows through
 broad shallow pools and
 shallow channels between
 hummocks and root

platforms. Cusces have
 a braided appearance (photo)
 Deer tracks abundant along
 some of these channels.

Channels marked by
 black wet leaves against
 tawny dead leaves and
 grass of hummocks.

Canopy here is almost
 complete, but perhaps
 thin. Spacing from
 3 to 5 m. *Ilex opaca*
 occasional in this
 swamp but only tiny
 saplings 0.5 m. tall or
 less.

On surrounding slightly
 higher ground there is a
 dense understory of *Ilex*
 about 3-5 m. tall among
Liquidambar and *Acer* and
 scattered *Pinus taeda*. Much *Rhododendron*.

Toward the fields (p. 100) this becomes less and less hummocky, the wet ground covered by thin grass.

A broad flat levee, perhaps an old roadbed cuts straight across this. ~~The levee cuts~~
On slopes and top of levee much tangled *Smilax*. Levee interrupted by a deep black elongated pool 6-7 m across, connecting the swamp on both sides.

55 or 60 acres for sale, belonging to William B. Denton
Box 184 Rt #2, Know Hill, Md.
(Ph. Princess Anne 734-W2)

A few acres of it are in cultivation. A few acres are fairly good loblolly pine, part of the soil, on the higher parts, is logged over, the larger trees removed.

The larger part is swamp which has no very large trees, but shows no signs of recent logging. The swamp probably occupies at least half the acreage. He wants \$10,000 for everything but the house.

Most of the land that is above the water table has considerable *Smilax rotundifolia* in the undergrowth. ~~The~~ *Ilex opaca* is dominant understory tree.

106

1962 Maryland

Labels
written

43398

2

Dec. 9 - west of Snow Hill,
just outside Potomac State Forest
Lycopodium obscurum
common very locally in
Pinus taeda forest on low
sandy soil.

Worcester Co.

107

spreading by underground
rhizomes.

Dec. 15 - about 7 miles north of Culpepper on rt. and between there and Culpepper are excellent examples of fence-rows of *Juniperus virginiana* in all stages of development from a few tiny seedlings to dense rows 70 ft. tall.

Juniperus shows a tendency to invade fields where they are not cultivated, esp. where they are dominated by *Andropogon*. Hence they are found in pastures and not in cultivated fields. The prominence in fence rows may be due to a combination of the fact that seeds are dropped here by birds sitting on the fences and the fact that they are not eliminated so effectively from fence rows by cultivation.

Jan. 1 Sleepy Hollow.

s. of Falls Church
Fruits (empty heads) of *Liquidambar* have fallen in some quantity on the snow. Considerable wind last night. Many still on trees.

Jan. 6 Sleepy Hollow.

Many *Liquidambar* fruits still on trees.
(3 photos).

Jan. '73 - Head of South River,
Bet. Tarnan Br. and Rt. 50
Intersection of Tarnan Br.
North River, Bacon Ridge Br.
to form South River.

Lower Tarnan Br. lined
with marsh.

High land about 15 m.
bluffs to marsh abrupt.
wooded, some trees tipped.
High ground with some
growth hardwood, a
few *Pinus rigida*, *P. virginiana*,
Large *Liriodendron*,
oaks, small beech,
scattered small *Ilex* sp.
a few large beech. Some
Myrica. A few *Kalmia*.
Rhododendron and *Gaylussacia*
abundant. Patches of *Kalmia*.
One *Liriodendron* perhaps
1.5 m dbh. Good *Kalmia*
on ravine banks.

Several large ravines
perpendicular to Branch.
Forest becomes much
better in area cut by
ravines. No *Lonicera* here.
Many trees 3-6 dm dbh.
On n. side of large
ravine large area of
Kalmia, none on other
side. On top of
ridge patches of

some
Lonicera

pine, dwarfed hardwood
surrounded by tall hardwood.
230 acres

Joy Neck

Miss Nancy Murray
died. Will leaves life
interest to Adelaide Calhoun
to go to an eleemosynary institution
for a wildlife sanctuary
at her death. Cory +
Equitable Trust are executors.
Jarva 360-400 acres
was left to Smithsonian
+\$1,000,000 without strings.
1 property prob. worth 250,000 +.

Jarva has areas of
really fine old forest
such as along the road
in and on the point at
end of road.
Other patches in various
stages of succession. Some
marsh.

Jan. 20 - Forêt de Fontainebleau
in ~~this~~ open scrub forest
of *Betula alba* with
Calluna shrub layer on sandstone

- 43399 *Calluna vulgaris*
dominant in shrub layer
400 *Erica cinerea*
occasional
401 moss *Rhacomitrium lanuginosum*
common on rocks
402 *Betula alba* var.
dominant
403 *Betula alba* var.
dominant

A considerable area on
the sandstone terrace
normally covered by *Pinus*
sylvestris, has a
pure stand of *Betula* in the
tree layer, 4-6 m. tall. ~~or~~
1-3 m. apart, so young
that no trace of black
roughness ~~at~~ has
appeared at base, a
shrubby layer 0.5-1 m. tall
of *Calluna*, with much
bare rock with moss.
Ice coats the rocks and
small pools are frozen
solid.

In places *Pteridium*
replaces the *Calluna*.

shrub 0.7 m. tall.

dwarf shrub 2-3 dm. tall

small tree 5 m. tall with
white bark, dark
scars.

small tree 6 m. tall
with white bark, dark scars.

In the pine forest around
this is much broken.
Larger *Betulas* here mostly
show black furrows
at base.

In the deciduous forest
some is pure *Fagus*,
some *Fagus* and *Quercus*.
Some areas have a
conspicuous tall
shrubby layer of *Ilex*
aquifolia.

A large highway
is cutting a terrible
swath through this
forest. The forestry dept. is
said to have made a deal giving
this up and buying forest in west of France.

Jan. 25 - Road from Fontainebleau to Orléans
 over almost the whole distance
 the trees are white with ice (in
 very solid and thick frost), and
 ground has thin powdery snow,
 but no ice on highway.
 The ice is not thick enough
 to break branches from trees.

Orléans to London solid fog -
 top level, with patterns
 on top, including a great
 arcuate sharp line convex
 north. Over England widely
 scattered curious little
 knobs or bumps protruding
 from top of fog layer. Open
 patches showing snowy
 countryside, escarpments, etc.
 near.

At London Airport same
 appearance of frost on
 trees - examined closely
 is a tufted fan of dendritically
 branched soft frost crystals
 each serie, forming a cylinder
 3-8 mm. long, 1-2 mm. thick
 very closely and intricately
 branched, perhaps anastomosing
 perpendicular to wings and
 branching perpendicular.

116

117

901819 -
902075 -
901633

Theodore Barbley
U. of Kansas - int. in St. Louis Mo.

Dimitri Lucie Benjamin
Bot. gard. Rio.
Rubiaceae

Find out if warming
Laguna Santa has ever
been translated into English
or Latin.

Barra de Tijeras

Raven's Hollow

Warrenton, Virginia

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Raven's Hollow

Warrenton, Virginia

PROVIDING an opportunity to return to our outdoor heritage is the purpose of Raven's Hollow near Warrenton, Virginia. Raven's Hollow, one hour from Washington, is a place where a man and his son can rediscover the pleasures of the outdoors.

Raven's Hollow is dedicated to conservation, physical fitness, wildlife and to the relationship between father and son.

It is a place for those who are dedicated to maintaining a refuge for thought and participation in the pleasures of the outdoors can gather.

Raven's Hollow was formed by persons who are vitally interested in the exchange of ideas and in the conservation of our American Heritage. It is a meeting place for those having these interests and those who have dedicated personal resources to the advancement of the Airlie Foundation.

Facilities

- Hunting in a six hundred acre game preserve
- Skeet
- Golf
- Riding
- Hiking
- Tennis
- Lake swimming, fishing and boating
- Overnight accommodations
- Excellent Food
- A rustic shooting lodge
- Films
- Lectures

Location

Raven's Hollow is located on Airlie Farm, four miles west of Warrenton, Virginia.

Information

For information write Raven's Hollow, Warrenton, Virginia or Call Warrenton 347-1300, area Code 703.

Warrenton Estate Becomes a Think Center

For The Thinking Man

AIRLIE House, the big, graceful think center near Warrenton, Va., has a serene pace that won't appeal to the average convention-goer. Nevertheless, its popularity is increasing, perhaps proving as its founders believe, that shops, bars, theaters and other convention city attractions have a serious competitor in tranquility.

Lester Van Atta, Hughes Research; Albert E. Burke, TV news analyst; and Maurice Albertson, Colorado State U.

Luxury Of Thought Is Airlie House Necessity

Serenity and Service for Thought

THE NATION'S CAPITAL, with its high concentrations of brain power, now has its own Think House, centered in a mountain-locked island of rural retreat outside Warrenton, Va.

There, isolated in 1200 acres of rolling pastureland, is a new conference center designed to provide the atmosphere for clear thinking. It is called Airlie House, itself the brainchild of the Nation's only dentist-physician-lawyer, Dr. Murdock Head.

Modeled in purpose after New York's famed Arden House, it is no plush, rococo retreat. The facility is an assembly of Georgian manor houses, lodges and guest accommodations, redesigned to modern comforts, such as air conditioning and wall-to-wall carpeting. It is a working conference center away from the distractions of busy offices or ordinary convention assemblies.

At Airlie House someday, some of the world's thorniest problems may be challenged for the "best interests of the public"—the founding phrase which sets it above and apart from swank, commercially operated resort hotels.

It has its horse country recreations—riding, hunting, fishing, hiking, tennis and skeet shooting. But primarily its chief attractions are solitude, service and serenity for thinking men and women concerned with the public's problems.

Here big wheels and little cogs can be brought together. Participants talk, and listen to each other, and ponder. They agree and they disagree, and they carry their impressions, their sometimes changed and sometimes reinforced ideas back home with them. It's something like oldtime town meetings, or discussions around the pot-bellied stove in the country store, revived and modernized.

Such isolation and total submergence in the subject matter can spell the difference between an effective conference and an ineffective junket.

Airlie House, named for a Scottish Lord, is operated by Airlie Foundation, a nonprofit organization chartered by the Commonwealth of Virginia. Its proximity to Washington makes it readily available to Congress, government agencies, research and educational centers and industry without the problems of excessive expense or travel time loss.

Its rates vary with the type of conference, the number of participants, and the services required. In general, they have ranged from \$20 to \$25 a day for each participant, a charge comparable to convention headquarters hotels in major metropolitan areas of the United States.

One recent conference at Airlie House attracted more than 100 leaders of industry, education, armed forces and the government. This was the third annual Strategy for Peace Conference, whose previous conclaves were at Arden House.

The conferees discussed such things as the interrelationships of military strategy, technology and

arms control; disarmament and military stockpile inspections and control; the economic aspects of disarmament; changing emphases in the United Nations, and the economic and social development of emerging nations. Previously, Airlie House had accommodated sessions of the American Religious Heritage Society.

Conference subjects may be as broad as the world has problems. Any group with a serious problem of public interest to discuss is eligible to stage a gathering at Airlie House.

The organizations which sponsor conferences there pay the costs. Some pass these costs on to the participants; some bear part of the costs out of their treasuries. The founders of Airlie House are seeking funds to sponsor or help sponsor worthy conferences which may never otherwise be held for lack of leadership and funds.

The food is good, and ample, and usually served cafeteria or buffet style. Millionaires may be used to higher luxuries and services than can be made available at present charges, but unless such demands become important, the facility will continue on its present course, says Dr. Head.

Dr. Head is the three-letter man of the professions. He earned a dental degree, and when he found that barred him from certain surgeries, he entered medical school and won his M.D. Then he found that dentists and physicians needed legal help, so he studied law and won a degree in that profession.

Now chairman of the Institute of Forensic Medicine at George Washington University, he is content that his brainchild, Airlie House, is here to stay. The money he and his influential friends raised to set it up and get it going, he said, is a good investment for the Nation.

He's going to develop other interests, like medical research in the special clinic on the Airlie Farms estates, and television programming and the making of documentary films.

By Nate Haseltine
Staff Reporter

Airlie House stenographers, secretaries put the spoken words into printed forms.

dining hall at Airlie House. Meals are simple but adequate, generally served buffet style to the delegates.

Above, two delegates to a Strategy for Peace Conference at Airlie House meditate during a morning stroll.

Gen. J. Lawton Collins (USA, ret.) and the Rev. E. A. Conway, Director, Creighton University Center for Peace Research, discuss important point.

Arthur N. Holcombe, Chairman, Commission to Study the Organization of Peace, reads a report.

The possibility of producing a documentary film series at Airlie House is the topic of debate by TV lecturer Albert Burke and Dr. Murdock Head.

Accommodations at Airlie House range from a 65-man dormitory to more luxurious surroundings such as this room being shown to Mrs. John Marvin by John Bordelon, administrator of Airlie House foundation.

in Greater Washington

Sunday, December 2, 1962 B1

Planners Laud Kennedy Stand On Open Spaces

By William Chapman
Staff Reporter

President Kennedy's official recognition of the need for preserving open spaces in the Washington area could not have come at a more opportune moment in the view of suburban planners in Maryland and Virginia.

It came at a time when comprehensive plans for saving large wedges of farms and woodlands are being presented publicly in the growing suburban counties on both sides of the Potomac.

In a statement Tuesday supporting the corridor concept of developing the National Capital area, the President declared:

"It shall be the policy of the executive branch to seek to preserve for the benefit of the National Capital Region strategic open spaces, including existing park, woodland and scenic resources."

These open spaces are essential to the corridor development plan because they would separate the extended zones of high-density development planned to stretch out through the suburban countryside.

The goal of keeping these spaces free of cluttered, hazardous development poses the biggest problem for the corridor plan itself.

But on both sides of the Potomac, planners believe that President Kennedy's endorsement will aid materially.

"Thank heavens he came out when he did," said Fairfax County Master Planner Rosser H. Payne. "It was just luck, of course, but it is certainly timely. It will give us a terrific boost."

Fairfax planners Wednesday released their version of a corridor plan applied to local conditions and next week will release a program for preserving open spaces.

In suburban Maryland, the President's statement is expected to add emphasis to a proposed general plan incorporating the corridor concept. Public hearings on it will be held in January.

Planners in Fairfax and on the Maryland-National Capital Park and Planning Commission are offering similar methods to keep the open spaces open.

Their programs include purchasing of parklands, zoning for low-density development, tax policies which encourage farming and the acquisition of easements. Here is what they foresee in each category:

Purchase — With enormous areas involved, outright purchase of open spaces can do only a small part of the job. This is particularly true now when the traditional source of parkland money, the Capper-Gramton Act, has dried up.

With a 2.1-million-dollar assist from the Urban Renewal Administration, suburban Maryland is forging ahead on 45 different purchases ranging from large tracts in the Upper Rock Creek watershed to several regional parks in Prince Georges. It is hoped that 4000 acres can be ac-

quired under the present program and that more Federal money will be made available next year.

Fairfax County will be asked to buy up 27,000 acres in a long-range program, starting with the remainder of a 4-million-dollar bond issue.

Zoning—By limiting development to scattered large lots through zoning laws, the counties can hold off non-conforming development for some time. Montgomery County has rejected five-acre zoning as too extreme but it has made two-acre zoning stick in many up-country areas. The Prince Georges maximum now is one-half acre lots, but new zoning categories will be proposed next year.

Fairfax County's two-acre zones were overruled in the courts, but only because they were indiscriminately applied to nearly two-thirds of the County. The new open spaces plan will propose two-acre restrictions according to a carefully designed over-all concept.

Taxes—To help farmers who want to resist the pressure of fast-rising land values, Maryland's preferential tax law offers low assessments on agricultural properties. Changes will be proposed in the General Assembly to prevent speculators and land developers from taking advantage of the tax privilege.

Fairfax County planners will suggest a similar law with built-in protection against speculators.

Easements — The Virginia and Maryland planners will encourage the purchase of conservation and scenic easements of strategically-placed open spaces. The land-owner will be paid for keeping his property undeveloped as long as the easements are in force. In effect, the public buys a stake in the land for the difference between what the owner could sell his land for with and without the restrictive easement.

In all three suburban counties, the planners want to move fast because several presently planned developments would conflict seriously with the corridor plan.

In Prince Georges, DISC, Inc., is seeking zoning for a 2500-acre tract in the Largo area where planners envisage a wide expanse of open spaces.

In western Fairfax County, former Supervisor George Landrith has applied for rezoning of 200 acres far from the corridor leading to Centreville. Planners expect development pressures all up and down the 30-square-mile Pohick Watershed, now labeled for open space.

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702075 -
701633

Theodore Barbley

U. of Kansas - int. in pt. Flain Vag.

Dimitri Lucie Benjamin

Bd. gard. Rio.

Rubiaceae

Find out if warmings
Lagor hantaa has ever
been translated into English
or Latin.

Barro de Tiquero