RECORD

67
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Collection and Field Note Book

No. 69

(July 12, 1963 - Nov. 10, 1963)

(43891 -- 44447)

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F. R. Fosberg
Field Book No. 69

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for reward

1963 Borneo - Brunei

1

3

July 12 - B. Seria

P. Jants

Casuarina equisetifolia
Ravenala madagascariensis
Asplenium nidus
Delonix regia
Acacia auriculiformis
Cocos nucifera
Allamanda cathartica
Allamanda violacea
Codiaeum variegatum
Acalypha arvensis v. wilkesiana
Hibiscus tiliaceus
Ipomoea pes-caprae
Pteridium aquilinum s.f.
Pithecellobium dulce
Merium indicum
Plumeria rubra
Plumeria obtusifolia
Musa sapientum

Arrangement of vegetation:
Casuarina eq. strip on beach ridge
belt of clearing ^{meadow} cult. & thickets
belt of Dryobalanops forest.
transition to peat swamp.
several phases of peat
swamp descr. by Anderson

July 12 - Seria - Badar
by narrow gauge railway
dep. 7:45

Peat is a biconvex lens
with clay ^{subsoil} in center, sandy
ground nearer periphery.
Periphery, except near beach,
seems to be result of
natural levee formation.

Originally was a bay with
mangroves. Sea level fell.
Peat developed rapidly at
first, slowed down as dome
formed. (J.A.R.A.)

Along r. is *Ischaemum*
solid stand, on ^{it} side a solid
mass of *Blechnum* (*Heterochloa*) sp.
with reddish young growth.

Dactylocladus is in
all communities, has
characteristic vertical
conical pneumatophores.

Second stop in rather
disturbed peat swamp
of enormous *Shorea Albida*
trees on rather shallow
peat. Climbers abundant
mostly closely clinging
to trunks. Ground layer
almost entirely of
seedlings and creepers.

and
epiphytes

Third stop -
thinner forest with
mostly more slender
trees, canopy still
open - somewhat disturbed
epiphytes less abundant.
Termite nests on knee
just above high water.

Fourth stop - thicker
forest of smaller trees.
Canopy still rather open.
Patch defoliated and
killed by caterpillars.
Secondary scrub forest
of species from surrounding
primary under story.

Fifth stop - smaller
trees, full canopy, not
more than 20-35 m high.
few *Shorea albida*, many
Litsea palustris. Shrub &
small tree layer rather
thick, but possible to walk.

Badar. Agathis forest on
sand ridge. Sand white
with organic B horizon
this very irregular,
with cylindrical and
wrinkle shaped irregularities.

Thick understory
to 6 m. with great
agathis 30-40 m. towering
above in an open stand.

Near river a shrub
swamp. HoSEA climbing
in shrubs + trees. Shrubs
+ clumps of shrubs widely
spaced, with mud between.

July 13 - ^{east} north of Senia

Dryobalanops forest on
inner edge of old beach
sands - pure stand of
Dryobalanops nappa
Trees to 25 m. tall, to 4-5 dm dbh
spacing 3-5 m. canopy
rather open.

Some Dyera, with large
knob-like pneumatophores.
These drip latex when
scratched.

Transitional forest to
fresh water swamp
Trees to 30 m. tall, up
to 5 dm dbh. ~~some with~~
~~pneumatophores~~. Canopy
irregular, open to closed.
Trees of all diameters.
Second story not well
defined but cover considerable.
Shrub layer also not
well defined. Shrubs
from 0.5 m. to 1.5 m. grading
into trees. Prominent
but not dense enough
to impede movement,
except for occ. rattans
and Galacra.

Herb layer of scattered
sedges + many seedlings.
75% ± of ground bare,
covered by dead leaves.

Occasional large
emergents to 50 m. +
1.5-2 m dbh.

(Photos of Hentiera aurea for
Kostermans)

This is mostly on
a complex of low natural
levees along small
meandering streams.
Deep yellow fine-silty sand soil.

The swamp, itself,
is much more open below,
with large trees to

40 m. and 1 m. dbh.

Second story prominent
at 10-15 m.

Open beneath except
for scattered *Lumnitzera*.
Many lerp-like
pneumatophores
pools & hummocks
on ground.

Said to be flooded
frequently, with
silty water.

Peat rather thin, on
white sand.

Mixed dipterocarp forest
on slope. Trees up to
57 m. (emergents)
photo box of termite
nest for Kostermans.

Whiteodendron

buttressed, 3 dm. about 6.
20 m.

On ridge a thick forest
of small trees about
20 m. tall, with scattered
emergents to 30 m. or more.
Few shrubs, almost
no herbs. Thick layer
of leaves on ground.
Many of big trees buttressed,

to 10-12 dm. dbh.
2 box. photos.

On slopes more
undergrowth and
more medium sized
trees.

On ridge - *Gnetum* (vine)
photo box

Colony of *Geophila pilosa*
on broad ridge top
in mixed dipterocarp
forest. Colony is rather
extensive, mostly sterile.

Soil on these ridges
is bright yellow deep
silty sand. No profile
development.

Paleo all
done (check)
to end Borneo

July 13 - Anduki Forest Reserve,
Seria
in tall "heath forest", the
canopy layer an almost
pure stand of *Dryobalanops rappa*,
on peat-covered sand.

1-2 m.

43891 *Dryobalanops rappa* Becc.
dominant tree

with
A. 2
2

92 *Timonius pedunculata*
in shrub layer

93 *Hypolytrum*
very common

94 *Psychotria* "Dora"?
rare in shrub layer

July 13 - Andulan Forest Reserve

no alt.

95 *Melastoma beccarixanum* Cogn.
in bushy second-growth
thickets on sandy soil

same ~~as~~ - in transitional
forest on flattish stream
bottom land

96 *Trichomanes*
rare on forest floor

97 *Scluzaea dichotoma* (L.) Sm.
occasional

98 *Mussaendopsis* (or *Jachia*?)
~~tall tree~~

fruits and dry leaves
from ground. Twigs
from saplings 3 m. tall.
ripe fruits greenish white.

fruits dull whitish, not quite ripe;
shrub 1 m. tall, branched.

shrub 3 m. tall.

very dark green.

rhizome deeply buried
under dense root mat
of trees.

tall tree; fruits picked up
from ground.

same - in fresh water
swamp forest

43899

Polyalthia

occasional

+ 900

Landroicum cf. mainyayi Hiern
rare

same - ~~in~~ in mixed
dipterocarp forest on
low ridges

10

01

Whiteodendron

rare

1

02

Dipterocarpus sarawakensis V.S.L.

rare

5

03

Memecylon

rare

1

04 (orch)

rare

3

05

Gnetum

rare

5

06

Schizaea (Actinostachys)

common

1

07

⁵ Serialbizzia splendens (Miq.) Kost
rare

2

08

Heritiera impressinervis Kostermans

rare

2

09

Antidesma

rare

1

10

Pentace

rare

slender, scarcely branched
shrub about 4 m. tall.
slender shrub or small
tree, fruit immature, gray.

buttressed tree 20 m ± tall,
3-4 dm diam. above buttresses.
fruits and leaves from
ground beneath large tree.
small shrub, 1 m. tall.
buds lavender, corolla lobes
reflexed at anthesis, white
~~and~~ within, stamens purple.
flowers white, each
segment marked with a
central stripe and distal
spot of purple
thick leaves with
conspicuous nodes, sterile,
erect.

enormous tree with clear
bole, no buttresses; fruit
picked up from ground.
sterile tree

shrub; fruit immature

sterile tree

43911 *Polyalthia*

rare

12 *Geophila pilosa* A. Chevalier
very local, fair sized
colony on broad ridge-topsame - in secondary growth
along road

5 13

July 14 - Brunei

14 *Acrostichum aureum* L.
edge of ~~sea~~ estuary

July 14 - Jesselton, North Borneo

15 *Cordia*

roadside in hills

16 *Spermacoce suffruticosa* Jacq.
roadside ditch17 *Hedyotis corymbosa*
roadside18 *Phyllanthus*
roadsidesmall slender tree;
cauliflorous.prostrate, petioles rather
thick, stems and petioles
dull maroon; leaf blades
paler beneath, veins
maroon; flowers ~~and~~
fruits very rare; corolla
white, lobes patent; fruit
black. Calyx lobes oblong
obtus; corolla sparsely
pilose without, lobes
5-6, distally purplish without.

shrub, in bud only.

1 m.

sterile; young fronds reddish
green.

50 m

shrub 1 m. tall; flowers white.

3 m

erect; flowers white.

↓

diffuse plant; flowers white

July 14 - trip by car Seria to Brunei.

Considerable grassy areas, both on flat ground around Seria and on hills beyond - dominated by *Ischaemum* cf. *magnum*. Almost no *Imperata*, a little only on roadsides in Seria.

Plants

Mimosa pudica
Paspalum conjugatum
Sporobolus spicatus
Centella asiatica
Pilea lobata
Pomoea fistulosa
Hevea brasiliensis
Cordyline fruticosa
Polypodium quinquefolium
Quisqualis indica
Spathodea campanulata

~~July~~ July 14 - Brunei - Jesselton trip.
 Foster Friendship, at side. 9:00
 started 2:30

Low hills are wooded. Rubber plantations can be distinguished by uniformity except for partly deciduous trees. Island and peninsula with curious striated structure, probably sand ridges.

2:40 crossed coast opposite side of bay.

Gigantic tidal stream flowing in fine-textured vegetation - black streams. Some coarse textured forest inland, then green grass with gallery forest along streams.

A black stream meandering along course. ~~For~~ mostly forest on other side of it. In distance a light, very muddy one meandering same direction.

2:45 A black lake ~~and~~ surrounded by swamp on course.

2:45 Coast with long curved sandy beach. Black stream parallel with and back of it, emptying near course. Large area of forest.

probably peat swamps
back of it. large clearing
in distance. Crocker Range
back of all in distance.

Out to sea, then closer
to land again. More and
more cleared land as
we go along coast. a low
isolated hill, wooded,
on coast near an angle
and river mouth.

Tiny rocky islet with
clump of woods.

251 Small patch of
mangrove near mouth
of stream. Then hills
run down to shore.

254 Small islands - hilly
parts wooded, flatter
part of larger one in coconut.
Hills on shore - steep slope
terraced and cultivated

255 Complicated sand spits
with Casuarina.

Appr. airport - some
mangrove. Wooded hill.
Small patches of coconuts.
Barrier island with Casuarina.
Avicennia swamps on
mainland.

257 Arrived Jesselton.

July 14 - Jesselton

Plants seen:

Eleusine indica
Sporobolus diander
Euphorbia prostrata
Paspalum conjugatum
Artocarpus ~~sp.~~ altalis
Malvaviscus arboreus
Chloris inflata
Euphorbia hirta
Clidemia hirta
Cordia variegata
Imperata cylindrica
Cananga odorata
Pithecellobium dulce
Bougainvillea spectabilis
B. glabra
Tecoma stans
Catharanthus roseus
Pedilanthus tithymaloides
Cynodon Dactylon
Stachytarpheta urticifolia
Pityrogramma calomelanos
Lycopodium cernuum
Cyperus hyalinus
Chrysopogon aciculatus
Cassia spectabilis?
Cerbera pentandra
Mangifera indica
Samanea saman
Delonix regia
Passiflora foetida var. *hirsuta*
Hyptis capitata
Albizia falcata

Lagerstroemia speciosa
Scoparia dulcis
Paspalum cf. orbiculare
Desmodium triplorum
Vernonia cinerea
Cyperus rotundus
Ipomoea cinerea
Anacardium occidentale
Nevea brasiliensis
Caesalpinia pulcherrima
Thunbergia grandiflora
Arystida gangetica
Cyperus brevifolius
Peltophorum ferrugineum
Clitoria ternatea

Losopodon
 (Front Rest House)

km. 17⁺

km 18 b.w. photos began
 roll, in shifting aqua.
Solanum mammosum

Kundasang -

Tibouchina semidecandra
Passiflora foetida
Dahlia variabilis
Scoparia dulcis
Paspalum conjugatum
Axonopus compressus
Salvia splendens
Imperata cylindrica
Bixa orellana

several photos of Kinabalu
 from Kundasang

near jet with Kinabalu rd.

Setaria palmifolia
Centella asiatica

Hon. Donald Stephens

Member For Natural Resources

also Chairman Secretariat
 Kinabalu Mem. Fund Jesselton W. Borneo (Sabah).
 from

243209

July 15 - bet. Jesselton & Tamparuli
 Tuaran River, 1 mile from Tamparuli
Millettia vasta Kosterm.
 in secondary thicket on steep slope

100'

30 m.

fair sized tree; flowers
 bright rose purple, fragrant.

100'

30 m.

spreading tree; flowers
 pale yellow, becoming ~~deeper~~
 yellow with age; pods
 curving on dehiscence.

2550'

800 m.

July 15 - n.w. of Kokohitan Peak
 mile-stone 17 from Tamparuli
 on Renan Road, ridge w. of Kad
 in secondary thickets
 on steep slopes

Kadamaian River

small tree; stamens white.

erect herb; corolla white,
 palate with 2 yellow lines.
 erect herb; corollas white.

caespitose, many canes
 to about 2 m. tall, from base.

2700'

830 m.

Rivers

stamens white

5500'

1540 m.

spreading herb, stems blackish
 purple; flowers bright purple;
 fruits green.

2

20

July 15 - Tamparuli
Adenanthera cf. microsperma
 growing along street

2

21

occasional

1

22

(lab.? verb.?) *Bruchia*

occasional

0.1

23

(verb.?)

occasional

3

24

(grass)

very common

July 15 - ~~n.w.~~ ^{near} of Kokohitan Pk.
 milestone 18 from Tamparuli
 on Renan Road, ridge w. of Kadamaian

Rivers

2

25

Abarema

in secondary thicket

start
 Kinabalu

3

26

July 15 - Tenompok Pass,
Solanum Mt. Kinabalu

July 15 - above Kundasang

10

43927 *Trigonobalanus verticillatus* Farman
in wet forest on top of hill on
with W. Meijer ridge

July 16 - ridge from
Ternopolis Pass to
Kamburongoh.

2 28 *Grammitis* (Xiphopteris)
occasional on bases of ~~the~~
recently cut trees

6 29 *Trichomanes* mossy
very common on tree trunks

2 with 30 (melast)

1 killed 31 *Lithocarpus borneensis*

9 32 *Elatostemma*
common on mossy ground and fallen logs

5 33 *Argostemma*
common on mossy ground

2 34 *Asplenium*
rare on mossy ground

2 35 *Cyathea*
rare

3 36 *Elatostemma*
colony on log, with # 43937

5 37 *Elatostemma*
colony on log, with # 43936

5 38 *Argostemma*?
common on mossy ground

29 ~~*Sonerilla picta*~~
occasional on mossy ground

2 39 *Sonerilla picta* Korth.
occasional on mossy ground

tree, sterile.

1700-1800 m.

→ on ridge crest in montane rain forest

X

shrub

Tree

leaves white beneath.

small tree fern, trunk
slender (about 5-6 cm diam)
(slight intergradation with
43937)

(slight intergradation
with # 43936)

buds on ~~axils~~ recurved
pedicels, becoming
erect after flowering,
corolla white, reflexed.
leaves with white areas
along veins; flowers pink.

July 16 - Trip up Kinabalu
- started walking at 4500 ft

7:40 a.m. through tall

montane rain forest -

up to 20 m., ~~covered with~~ with

numerous epiphytes, in places with great amounts of lianes, elsewhere not.

In places with trees of all sizes, no differentiation into layers, in other places only canopy and a thin low shrub layer.

This becomes lower and more hygrophilous toward Kamburongoh.

In gulcher it is very wet, filmy fern and bryophytes very luxuriant. Crests in places somewhat open. Ferns generally very abundant.

Passed, at one place, a vertical rock face with almost no vegetation - dripping.

At Kamburongoh is a large clearing. Where it is not much trampled it is a tangle of *Blechnum*, *Gleichenia*, *Dicranella*, etc. Where trampled *Haloragis* has become

Camp 3340 m

very abundant. This is a native species, rather rare in bog, that has taken advantage of the open wet ground and become abundant here. *Gentiana borneensis* is also here. *Vernonia patula* is abundant.

Above this the forest has a lower stature and more gnarled appearance - is a true cloud-forest or mossy forest - better a scrub forest, perhaps 5-8 m. high, on ridge, probably taller in ravines. Blanketed with mosses and hepatics, lichens (Usnea) abundant on upper branches.

This changes abruptly with substratum - a large area of "ultrabasic" rocks - eroded in a rough jagged pattern.

Here is a sharp change in flora - ~~but~~ *Dacrydium gibbsae*, *Leptospermum recurvum* become very abundant. *Dipteris* drops to p. 30

- 43940 *Hymenophyllum obtusum*
 3 epiphytic on ~~the~~ tree trunk.
 3 41 *Sonerilla*
 common along trail
 2 42 *Lycopodium serratum*?
 rare on mossy ground
 1 43 *Sonerilla*
 rare on mossy ground
 1 44 *Sonerilla*?
 rare on mossy ground
 3 45 *Helaginella*
 common on mossy ground
 3 46 *Histiopteris incisus* (Thbg.) J.Sm.
 local
 1 47 *Argostemma*?
 rare
 1 48 (sub.)
 rare
 4 49 *Psychotria*
 common on ground and climbing
 on stumps and tree trunks
 5 50 *Viola betonicaefolia* Sm.
 common on wet rocks along trail
 3 51 *Elatostemma*
 very local, on wet vertical cliff
 1 52 *Grammitis* (*Xiphopteris*)
 rare, on wet vertical cliff
 2 53 *Adenostemma lavenia* (L.) O.Ktze
 rare on wet rocks along trail
 3 54 *Trichomanes*?
 rare on tree trunk
 2 55 *Mertensia granadensis* (L.f.) Druce
 very local, on rocks along trail

fronds pointed downward.

flowers pink.

leaves green (no white marks)
 flowers pink.

fronds erect or almost so.

1800-2000 m. forming tangles.

semi-prostrate shrub,
 corollas white, waxy.
 creeper, flowering rarely
 but abundantly when it does.

stems up to 1 m. or more long,
 maroon, clinging to cliff
 bare of leaves below.
 dark green.

flowers white.

prostrate; fruit scarlet

- 43956 *Grammitis* (*Xiphopteris*)
common on tree trunks
- 1 57 *Hedyotis*
occasional along trail
- 1 58 *Grammitis* (*Xiphopteris*)
rare on tree trunks
- 3 59 *Grammitis* (*Xiphopteris*)
very local
- 3 60 *Cambro*
common but not abundant
- 2 61 *Rhododendron*
common
- 7 62 *Psychotria*
rare
- July 16 - Kamburongoh
on s. slope of Kinabalu
in clearing around buildings
- 1 63 *Gentiana borneensis* Hook. f.
~~common~~ local
- 1 64 *Coclogyne* cf. *sulphurea* Reich. f.
on fallen log
- 3 65 *Hydrocotyle* cf. *javanica* Thunb.
local
- 4 66 *Halorrhagis*
abundant
- 2 66st *Dicrocephala latifolia* DC.
- 3 67 *Dianella*
in tangled herbaceous growth
- 3 68 *Rycopodium*
common in tangled herbaceous growth.

erect; buds white.

exactly the climbing habit
of *Chusquea*.
shrub 2 m tall.

slender small tree 4 m. tall,
ripe fruit yellow.

2130 m.

flowers pale purple

flowers white, a pale yellow
spot on middle of terminal
part of lip, 2 orange spots
on middle part.
prostrate

forming a mat on
~~the~~ open ground
flowers reddish.

flowers white; leaves
glaucous, stem to 1 m. long.

1963 Borneo - North Borneo

Hedyotis
monostachya
common
here.

Schizaea fistulosa in rock crevices.
out. The stature
becomes much lower.
3-4 m. at most, the
two dominant species
giving it a very weird
aspect, the canopy
very uneven.

This covers a substantial
part of the slope here,
the combination of
gray-green of *Leptospermum*
and yellow-green of the
Dacrydium makes
it easy to pick out,
even from a distance.

Locally is a patch
of dwarfed sparse
vegetation - wisps
of *Schoenus* making
up the dominant species,
dwarfed *Leptospermum*
common. Only 4-5 species
in most extreme area.

Carex sp. & *Cyathea* sp.
(almost acaulescent)
and a few other things
added peripherally.

Just below Paka Cave
the ~~vegetation~~ the ultrabasic
ends and granite
begins. *Leptospermum*
still remains an important
part of the scrub, but
Dacrydium drops out.

Nertera locally common
just below the cave,
along the trail and on
bases of trees in mossy
scrub.

Coprosma begins at
the cave, and is common
there and on up to just
about the level of our higher
camp, at 3340 m. From
there it becomes less common
up the steep part of the
mountain. In upper area
it becomes common again,
especially toward, and even at
summit. *Nertera* is only
common in the vicinity of
the cave. It has flat leaves,
here, not at all crisped as
in colony lower down.

Above 10500' scrub, mostly *Leptospermum*
extends in strips on ridges and
in ravines. Most of area is bare
slopes of granite 30°-80°. Granite
surface is rough, so one can walk
up even a 30° slope. Plants are in
crevices, small bogs, and ~~small~~
boggy crevices. In bog *Oreobolus*,
Monostachys, *Centropogon*, and
Eriocaulon acaule form striking
rings, dead in center. (photos). Tiny
Leptospermum shrubs in crevice
are the most striking vegetation.
A few species extend to summit.

- 43969 *Nepenthes lowii* Hook. f.
 1 very local in semi-open forest
 2 70 *Blechnum*
 very common in weedy clearing
 1 71 *Gahnia tristis* Nees
 abundant in weedy clearing

July 17 - ridge above
 Kamburongoh
 in ridge-crest phase
 of cloud-forest, low trees
 draped with epiphytes

- 2 72 *Hedyotis pulchella* Stapf.
 rare
 5 73 *Lycopodium casuarinoides*
 common in semi-open forest
 1 74 *Hymenophyllum*
 common on tree-trunks
 2 75 *Polypodium*
 occasional on tree-trunks
 3 76 *Pygeum*
 rare
 5 77 (amb.)
 rare
 6 78 *Diplocosia ciliolata* Hook. f.
 occasional
 3 79 *Rhododendron* ^{*stenophyllum* Hook. f.} ~~*angustifolium*~~
 common
 2 80 *Trachypogon* ~~*meneg*~~
 local in small grassy opening
 1 81 *Rhododendron acuminatum* Hook. f.
 rare in undergrowth

vine 1-2 m. long, climbing
 over bushes,
 young growth ~~red~~
 conspicuously reddish.
 caespitose, branchlets
 of inflorescence drooping.

- 7000-7500' erect shrub
 7100-7300' climbing in low trees.
 fronds curving downward
 shrub 1.5 m. tall
 slender understory
 shrub 3-4 m. tall, ripe
 fruit orange.
 shrub 1.5 m. tall,
 flowers white.
 shrub 1 m. tall, flowers
 orange-red.
 flowers white.
 shrub 2 m. tall, flowers
 vermillion.

- 43982 *Hedyotis*
5 common upward
- 3 83 *Eugenia*
rare
- 2 84 *Psychotria*
common
- 1 2 85 ~~*Leptospermum*~~
common
- 3 86 *Embelia*
rare
- 3 87 (sub.) *Urophyllum*
rare
- 4 88 *Eurya obovata* var. *reticulata* ? (Korth.) De Wit
occasional
- 1 2 89 ~~*Polyosma*~~ *Ternstroemia*
occasional
- 4 90 *Polyosma*
occasional
- 4 91 *Trachypogon*
occasional along trail
- 1 92 ~~*Drimys*~~ *piperita*
occasional
- 73 93 *Pygeum*
occasional
- 2 94 *Hedyotis*
common
- 5 95 *Leptospermum flavescens* Sm.
occasional
- 1 96 *Blechnum*
common
- 2 97 *Blechnum*
occasional
- 1 98 *Dipteris novoguineensis* Posth.
very common

- shrub 0.5 - 0.7 m. tall;
— flowers white, hairy within.
— slender tree 5 m. tall
— fruits purplish red.
— climber, rarely ^{seen} flowering;
— buds only, and immature fruit.
— flowers white.

scrambler

7500-8000' shrub, flowers white

2300-2400 m.

erect
↓

shrub 2.5 m. tall.

shrub 1 m. tall,

— fruit immature.

— shrub 2 m. tall; flowers
dull mauve-pink, fruit
black when ripe.

— ~~flower~~ plant reddish.

shrub 2 m. tall, bark
— very acid; fruit immature.

shrub 1.5 m. tall

shrub 0.4 m. tall

shrub 2 m. tall; flowers white.

young fronds red.

fertile fronds erect,

— ~~young~~
plant glaucous, young fronds
reddish.

- 43999 *Blechnum*
1 occasional
- 44000 *Hymenophyllum*
3 local, on tree trunks
- 4 01 *Hymenophyllum*
common, on tree trunks
- 2 02 *Isachne*
common in small opening
- 3 03 *Dianella ensiformis* (L.) DC.
common in degraded forest
same - ^{in mosaic scrub} on ultrabasic rocks
- 6 04 *Hedyotis macrostachya*
common
- 2 05 *Podocarpus imbricatus* var. *kinabaluensis*
occasional
- 2 06 *Phyllocladus*
common
- 1 2 07 *Vittaria*
rare, on tree trunks
- 1 08 *Hedyotis macrostachya*
common
- 2 09 *Elatostemma bulbosum* Stapf
common on rocks
- 2 10 *Euphorbia*
common on rocks
- 1 11 *Cyrtandra clarkii* Stapf
rare
- 1 12 *Podocarpus brevifolius* Foxworthy
occasional
- 2 13 *Daphniphyllum borneensis* Stapf
- 3 14 *Myrsine*
common

very glaucous

7000'
2100 m.

erect shrub to 0.7 m. tall,
flowers white, hairy within.
shrub 2 m. tall, fruit
immature.
shrub 3 m. tall ♂

shrub 0.5 m. tall, flowers
white.
leaves very rugose

flowers white, purple outside

flower crimson within,
dull pink without.
shrub 2 m. tall,

shrub 1.5 m. tall, flowers
purple.
shrub 1.5 m. tall.

- 44015 *Symplocos* cf. *buxifolia* Stapf
occasional
- 2 16 *Dacrydium gibbsiae* Stapf
very common, codominant
- 3 17 *Styphelia suavis* Less
very common
- 2 18 *Ilex pluvialis*
- 3 19 *Leptospermum recurvatum* ^{var} Hook. f.
abundant, codominant
- 1 20 *Calymmodon*?
occasional on tree trunks
- 1 21 *Lichyrea fistulosa* Labill.
occasional in rock crevices
- 1 22 *Aletris*
common
- 1 23 *Ilex*
- 2 24 *Hedyotis macrostachya*
common
- 3 25 (cyp.) *Machaerina*
occasional in area of dwarf
open vegetation
- 1 26 *Drimys piperita* Hook. f.
occasional
- 1 27 *Lithocarpus harilandii*
- 1 28 *Carex*
occasional
- 1 29 *Cyathra* cf. *harilandii*
abundant around an area
of sparse dwarf vegetation

July 18¹⁸ near Pakka Cave
s. slope of Mt. Kinabalu
in ~~the~~ mossy scrub forest

- 3 30 *Coprosma*

shrub 1.5 m. tall, flowers
white

shrub 2 m. tall.

shrub 1.5 m. tall, flowers
white.

shrub, ~~fruit~~ fruit red.

shrub 2 m. tall, flowers
white.

shrub
flowers white.

shrub 2 m. tall; fruit immature.

shrub 2.5 m. tall

acaulescent (one seen with
trunk 0.5 m.), prostrate erect.

9700'

3000 m

spreading shrub

- 44031 *Dichrocephala*
very rare along trail
- 1 32 *Coprosma*
9 (+ 32a) common
- 2 33 *Blechnum*
common locally
- 3 34 *Nertera granadensis* (L.f.) Oruce
common locally on rocks
and bases of trees
- 2 35 *Calymnadenia*
on tree trunks
- 3 36 *Carex capillacea* Booth
common along trail
- 1 37 *Polypodium*
on rocks

July 17¹⁸ Above Paka Cave
s. slope Mt. Kinabalu
in open boggy places

- 4 38 *Oreobolus*
common
- 2 39 *Monostachya centrolepidioides*
common
- 1 40 *Harlandia*
very local
- 1 41 *Gaultheria borneensis* Stapf
rare
- 1 42 *Ranunculus*
very rare
- 1 43 *Pilea johnstoni* Oliver
rare
- 1 44 *Gentiana lycopodioides* Stapf
rare

spawling shrub

fertile fronds erect

prostrate, stems reddish,
leaves not at all crisped;
fruit red.

caespitose

2800-

10000'

3000-3050m

forming dense cushions

forming dense cushions.

prostrate, flowers white

prostrate, flowers white.

flowers yellow

forming dense cushions.

flower white

July 18 - ridge above Paka Cave,
2. slope Mt. Kinabalu

in dense mossy scrub,
largely *Leptospermum recurvum*

44045 *Rhododendron ericoides* Locs
very common generally

2 46 *Polyosma*
common

1 47 *Coprosma*
common

~~48 *Euphasia*~~
~~on open rocky plateau~~

2 48 *Phyllocladus*
common

1 49 *Polyosma*
common

5 50 *Ilex*
occasional

2 51 *Rhododendron buxifolium* ^{Low} ~~near~~ ^{at} ~~the~~ ^{rocks}
var. *robustum*
common

1 52 *Eugenia ampullaria* Stapf
local

3 53 *Carex verticillata* Zoll. & Mor.
on rocks

1 54 *Belvisia*
on rocks

1 55 *Lycopodium*
on rocks

1 56
2 56a *Carex* ^{in muddy spot between large rocks}
July 18 - above Paka Cave
1. slope ^{mt} Kinabalu
in mossy scrub

1 57 *Ilex revoluta* Stapf
occasional

10200-

11000'

3100-3350 m

small shrub, up to 1 m. tall,
flowers vermillion.
shrub 1 m. tall, ripe
fruit black.
depressed shrub

shrub, flowers dull purple

shrub 4 m. tall

shrub 2 m. tall,
flowers crimson
shrub ~~1.5 m.~~ 1.5 m. tall

44053a *Carex perakensis* var. ^{borneensis (P.B.S.) Noth.} ~~perakensis~~

44053b *Carex filicina* Nees

shrub

10000'

3050 m

strictly erect shrub,
flowers white.

- 44058 *Coprosma*
common
- 2 59 *Hedyotis macrostachya*
occasional
- 5 60 *Coprosma*
common
- 1 61 *Myrica borneensis*
very local
- 4 62 *Phyllocladus*
common
- 2 63 *Monostachya*
in open boggy spot
- 1 64 *Eriocaulon acaule*
common in ^{open} boggy spot
- 1 65 *Rapenophora*
rare in ~~open~~ open boggy spot
- 1 66 *Calymmodon*
on tree trunk
- 1 67 *Centrolepis*
in open boggy spot
- 4 68 *Schoenus*
common in open boggy
places and rock crevices
- 2 69 *Poa*
common in open boggy places
- 2 70 *Styphelia suaveolens*
in open boggy places
- 3 71 *Daphniphyllum borneense*

July 18 - ravine above
Palsa Cave, s. slope Mt Kinabalu
on steep rock slope with local
low scrub

- 1 72 *Coprosma*
common

sprawling shrub

shrub 0.5 m. tall. flowers
white, hairy within.

— sprawling shrub

shrub 1.5 m. tall

shrub 2 m. tall

forming ^{small} cushion

forming small cushions

~~pro~~ depressed shrub,
flowers white
— shrub, fruit immature.

9
10000 - 3050 -
10500 3200 m

depressed shrub

- 44073 *Carex capillacea*
in rock crevices
- 2 74 *Lycopodium clavatum* L.
local in scrub
- 1 75 *Lycopodium*
local in scrub
- 2 76 *Leptospermum recurvatum*
dominant in scrub
- 1 77 *Coprosma*
occasional in scrub
- 1 78 *Coprosma*
occasional in scrub
- 1 79 *Lycopodium*
rare in scrub

July 18 - above ravine
on ~~a steep rock slope~~
on south slope of
Mt. Kinabalu
~~on a steep granite~~
slope

- 2 80 *Echeveria*
very common in crevices
- 1 81 *Anthoxanthum*?
occasional in boggy spots
- 1 82 ~~Daphniphyllum~~ *Drapetes*
rare in boggy spot
- 2 83 *Pilea*
rare in wet crevices
- 2 84 *Carex*
very common in crevices
- 1 85 *Leptospermum recurvatum*
abundant in crevices
- 1 86 *Leptospermum recurvatum*
abundant in crevices

tufted

creeping and scrambling

creeping

shrub in talus, flowers
white.

depressed shrub

depressed shrub

11500 -

12500'

3500 - 3800 m

flowers white.

prostrate

small tufts

dwarf shrub (green form)

dwarf shrub (~~with~~ sericeous
brown)

- 44087 *Scirpus*
common locally in boggy spots
88 *Euphorasia*
very common in crevices

same - in ravine

- 89 *Hedyotis gibbifolia*
common on rock slopes
90 *Coprosma*
occasional in rock crevice

July 18 - summit area
of Mt. Kinabalu

on bare granite slopes

- 91 *Anthoxanthus*?
in boggy crevices
92 *Potentilla*
rare in boggy crevices
92a *Styphelia swaveolens*
common in crevice
93 *Coprosma*
common in crevices
94 *Gentiana lycopodioides*
rare in boggy crevices
95 *Coprosma*
common in crevices
96 *Drapetes*
locally common in boggy
97 *Deschampsia flexuosa*? Trin.
in rock crevice
98 *Coprosma*
common in crevices
99 *Schoenus*
common in boggy crevices

caespitose

flowers white within

11000'
3350 m

shrub 0.3 - 0.4 m tall,
flowers white, hairy within

13000' - 3960 - 4090 m.
13450'

depressed shrub,
flowers white.
depressed shrub

prostrate,

depressed shrub, fruit
orange red, ~~p~~ fleshy.
flowers white.

spots

depressed shrub.

- 44100 *Coprosma*
common in crevices
- 3 01 *Lycopodium*
very local in shelter of boulders
- 1 02 *Coprosma*
common in crevice
- 2 03 *Poa*
~~rare~~ in boggy crevices
- 2 04 *Coprosma*
common in crevices
- 4 05 *Deschampsia flexuosa*?
local in boggy crevice
- 3 06 *Coprosma*
common in crevice
- 4 07 *Monostachya*
very common in boggy crevices
- 5 08 *Centrolepis*
common in boggy crevices
- 1 09 *Lycopodium selago* L.
occasional in crevices
- 1 10 *Eriocaulon acaule*
~~at~~ occasional in boggy crevices
- 1 11 *Oreobolus*
common in boggy crevices

July 19 - south ridge
of Mt. Kinabalu below
Kamburango
in montane rain forest

- 1 12 *Racemobambos*
common
- 1 13 *Polyosma*
4

depressed shrub

depressed shrub

depressed shrub

tufted

forming dense cushions.

forming small cushions

forming small cushions.

6800'
2070 m

climbing, habit of *Chusquea*
small tree, 7-4 m. tall.
sterile

44114 Hymenophyllum
common on tree trunks

4
with
P.R. 15

Hoya
rare on tree trunks

same - in deep wet ravine
near waterfall

5 16 Riccardia
on decaying twigs

3 17 Asplenium
common

3 18 Trichomanes
common, terrestrial

5 19 Hymenophyllum
common on wet soil slope

1 20 Calymmodon
on small tree trunks

4 21 Trichomanes?
common, terrestrial

9.1 22 Grammitis
rare, on rock

same - on steep wet slope
at base of cliff, in open montane
rain forest

2 23 Lophomeria
rare

1 24 Galium
on bare wet cliff

4 25 Hydrocotyle cf. javanicum Thunb.
common

7 26 Pratia

6800'
2070 m

fleshy leaves; pale orange
flowers.

6000'
1830 m

fronds erect.

5800'
1770 m

fronds erect

prostrate

scrambling herb, stems
1-2 m. long; corolla white, pinkish
within, split to base dorsally, fruit
immature.

44127

Hoya

1

rare on tree trunk

same - in tall montane

7

28

rain forest
~~Diospyros~~ *imbricatus* (Blume) de Laub. var.
~~Diospyros~~ *imbricatus* *patulus*
 common de Laub. cited by de
 Laubenfels, 1982.

1

29

Diospyros

1

30

Calyptranthes

on tree trunk

3

31

Humata

on tree trunk

1

31a

Grammitis

on rock face

July 19 - near junction
 of Kinabalu Road below
 Tenompok Pass

1

32

Hypericum

wet roadside

2

33

~~rough~~ *Torenia*

wet roadside

July 19
 Kundasang

1

34

Joinvillea

secondary
 rare in valley in wet forest

1

34 (germes)

Agave sp.
 rare, ~~at~~ creeping on ground
 and climbing on tree trunks.

5

35

Coelostegia borneensis *Bombac.*
~~*Coelostegia borneensis*~~ *Elaeagnus*
 in montane rain forest

4

36

Sphenomeris chusana (L.) Copel
 on sunny earthy bank

~~flowers~~ leaves fleshy,
 flowers ^{bud} pale orange

5000'

1525 m

Tree 15 m. tall

tree 15 m. tall, fruit orange

prostrate; flowers purple;
 plant purplish.

4300 ft

1300 m

cane 1 m. tall.

creeping
 corolla scarlet, stamens & style
 purple.

tree 30-4 m. tall, fruit
 spiny, dehiscent, seeds with
 small aril at one end.

July 20 - *Soropodon*, above
Kundasang, lower ^{south} slopes of
mt. Kinabalu

in tall secondary forest

44137

(balanoph.)

38

parasitic on roots of *Macaranga* sp.

39

Cephaelis

5000'

1525 m

bright crimson

fruit blue

July 21 - airstrip Jesselton - Kuching
 Folke Friendship left side.

3:48 Mangroves just south
 of Jesselton on loop of river
 are tall open *Avicennia*
 with dense understory
 of *Rhizophora* (?)

3:51 Small billie islands
 partly wooded, partly
 in coconut plantation

3:52 Many fires inland.
 Beyond a small point
 which is a range of hills
 protruding into sea is
 a flat area with some *Nyssa*
 and mangrove back of
 series of parallel beach
 ridges, but mostly cult.
 largely wet rice.

3:54 A series of southward
 pointing sand-spits at
 intervals along beach.

Country very smoky from
 fires inland. Sandy beach
 scarcely interrupted for
 many miles.

3:58 Course cuts across a
 large semicircular bay.
 Some cultivation, some
 forest

3:59 Rivers along this coast
 tend to parallel coast just
 back of beach, for several
 miles to south before emptying

into sea.

4:00 Great peat swamp, showing
 very distinctly the zonation
 described by Anderson.

4:01 Grassy plain, partly
 marshy, partly cultivated
 esp. along streams, then,

4:02 A large meandering river
 with gallery forest, also
 along tributaries, traverse
 this plain more or less along
 course. Reddish, large trees
 along some small tributaries
 a patch of forest. Then

4:04 another meandering stream,
 and between it and sea
 an enormous swamp,
 mostly fine textured, with
 estuaries forming a network,
 finer and finer subdivisions.
 An area just back of beach
 has been burned (perhaps
 logged first).

4:06 Left coast to cross enormous
 bay. Bay has a curious dark green color.

4:08 Huge river in distance
 carrying much silt into sea.

4:10 Approaching island & spit
 a rather irregular boundary
 between dark green and light
 milky green, then brownish
 silty water.

4:11 A long north pointing spit
 has *Casuarina* and *peppercorn*

grass in parallel bands at base. An island inside it has distal third wooded the rest parallel bands of scrub & grass(?) with strip of wood around coast.

4:14 Mosaic of wooded hills flat sand with open forest, cleared patches of grass on flat ground. Then farmland more woods. In middle distance wooded low karst-like hills. Patches of grayish trees and a matrix of secondary scrub, more cultivation and patches of tall grass as we approach Brunei airport.

4:17 Rubber plantation around airport. landed Brunei.

4:45 Took off.

More intricate little karst-like hills, with shifting agriculture and bits of primary forest.

4:47 Across main road is flat country, much of it cleared, apparently sandy. Stream with wide gallery forest. A large meandering river in distance.

4:49 Series of parallel ridges with woods - some rather good forest in places. Secondary thicket and clearings between them. Course roughly follows

4:50

Them. Course roughly follows

road for a distance, then road goes to left gradually. Some areas of grass, then good forest, probably peat swamp but phase 1 with a mixture of trees.

4:52 A couple of small hills have secondary thicket. A small closely meandering river, muddy. Some very black small streams.

4:53 Mosaic of grass and patches of forest.

4:54 A muddy lake in distance, drained by meandering stream with sand beaches on meander.

4:55 Complicated small hilly country with pine mixed forest, considerable extent. Shifting agriculture in distance.

4:56 apparently small swamp areas between hills.

4:57 Larger and larger swamp areas, with a ^{red} muddy river meandering through them.

4:58 An enormous peat swamp area, almost all *Thores albidus*. A green strip of ~~swamp~~ low growth along meandering reddish river.

Solid stands of *Thores albidus* with complete canopy except

- for numerous holes that may have been from lightning strikes scattered through them.
- 5:02 Spectacular patch, possibly killed by caterpillars, in this. Ox bows of black water.
- 5:03 Crossed large muddy river. Then more striking peat swamp with patches of caterpillar attack, also an enormous blow-down area, with a radiating pattern of streaks running out to west. Good zonation in swamp. A very long sinuous area parallel with course with low vegetation.
- 5:05 In distance an area of hills with terrific erosion scars.
- 5:06 Sharply dissected mass of hills with numerous land-slides. This continues along course - wooded except for landslides. Shifting agriculture beyond it. Beyond this several large swamp areas.
- 5:09 Hills end in rather irregular forest, then much shifting agriculture, dominating landscape except for certain apparently swampy spots which still have good forest. Communication here seems to be principally by a meandering

- river.
- 5:13 A wrinkled-looking area of small hills, mostly in shifting agriculture, then a part in good mixed forest.
- 5:14 Counting an enormous mosaic of patches of shifting agriculture and of forest.
- 5:15 A small much meandering river of black water reaches the coast through a sandy flat with a parallel structure as though it were a series of beach ridges. Along coast this parallel structure is evident in forest back for a little distance from beach. Great undisturbed forested area for some distance back from beach. Shifting agriculture in distance. This forest stretches a long way along coast - must be peat swamp, because of uniformity of crown and blackness of streams.
- 5:19 Meandering small black river, muddy for some distance back of mouth. More extensive forest, but with a small cleared patch far inside it.

5:20

A series of southward pointing
cusps or hooks in coast.

5:22

Forest continues, except for
a patch of shifting agriculture
extending inland along a
very small river.

Curious black margined
reefs here and there interrupting
beaches.

Forest extends with scarcely
an interruption, for
many miles. Looks slightly
hilly back from beach, but
now course is so far out to
sea that it is hard to see
clearly - also some haze.

5:25

More hooked cusps, but slightly
irregular. Hills clearer here.

This entire coast is lined
with a sandy beach, and
almost no ^{coral} reefs except
the curious tiny ones mentioned
above. No apparent explanation.

5:30

Sizeable estuary, some shifting
agriculture.

Visibility very poor, as we
are far out to sea.

5:36

Approached coast again.

8

Vast forests with light colored
emergents.

5:37

Large estuary.

5:38

Small streams pouring
black water into sea, so
there must be peat swamps.

Enormous areas with no
sign of disturbance.

5:40

Considerable area of clearing
with a few scraps of wood
left. More and more forest
as we go on, locally mostly
clear. Becoming mostly

5:42

forest with only a few
irregular strips of clearings,
then none at all for a little way.

5:43

Then an intricately meandering
river with a belt of clearings
especially on west side. Or bays,
black ponds. Probably this
forest may be swamp and
the strip of clearing may
be natural levee land.

5:45

Much shifting agriculture
in distance, forest along course.

5:46

Another very meandering
river and band of clearing.

Extremes of meanders touch
uncleared forest. ~~River~~

~~spreads~~ Upstream the
clearing spreads out
fan wise into distance.

Along course is undoubtedly
peat swamp of *Phorea albida*.
Many lightning holes
and two fan-like blow-down
patterns. Very black streams.

5:50

A very large river with a
strip of clearing along ~~as~~ each
side and one fairly large cleared

5:51

block in a bend; another,
also in a bend

This seems to be a distributary
from ~~enormous river~~ ~~large river~~

5:53

Large blocks of cultivation
in angles with main river.

Town with small airstrip
at junction of distributary
with main river.

5:54

~~Following~~ ~~crossed~~ main river. More
large distributaries and
some small tributaries
(on other side), actually
forming a network. Along
each is a band of cleared
land with gallery forest
along small streamlets
entering there at right angles.

5:56

Clouds - great cumulus
towering several miles
above plain.

5:57

More of same stream network
large river. but visibility very bad.

6:00

Stream network, with
occasional huge estuaries,
again.

6:01

Crossed coast. Some mangrove
at mouths of estuaries - some
of them only. Mangroves sparse.

6:02

rather straight coast with
sandy beach. Mostly forest,
some clearings back from
coast. Course getting far
from coast.

6:04

Great meandering rivers
in distance. Shifting
agriculture along them.
~~a large~~ ~~number~~ of fires burning.

6:05

Visibility very poor.

Crossing a very large
bay, too far from land
to make out detail except
for smoke from fires.

6:15

Crossed coast again. A wide
belt of mangrove with open
Avicennia and closed lower story.
Then extensive coconut plantations,
then Lungei Sarawak with
enormous meanders.

Much of interior of tongue
between meanders is cleared
and planted to coconuts, etc.

Enormous mangrove
swamp on west side, cut
by distributaries from
river and by smaller rivers.
Great areas of it are Nipa.
Some clearings away
from rivers.

6:19

Large area of Nipa along
Lungei Sarawak. Tiny
streams meander through
it. Nipa is several times
as wide as river on each side.

Heritiera globosa stands out
with golden crowns near
river.

6:21

landed at Kuching.

July 21 - air trip, ~~Singapore~~ Kuching - Singapore (same plane and seat)

7:47 took off from Kuching.

Shifting agriculture very general - many fires burning, making a bad haze.

Heritiera globosa common in mangroves close to rivers and small streams.

Kuching is quite spread out and open. New construction marked by bare areas of white soil.

7:51 Solid rubber plantations, blocks of different ages stand out.

7:52 Some peat swamps - black water streams.

7:54 Thick clouds. A few holes show forest and black streams. Then some forest on white sand, but visibility almost nil.

7:56 Holes in clouds - swamps with complicated tidal channels, visibility too poor to be sure if peat swamp or mangrove, prob. peat.

6:58 Vast unbroken forest, apparently peat swamp. Then some slight relief, probably mixed dipterocarp forest.

7:00 A small area of shifting agriculture several others in distance ahead.

7:01 Meandering small river with large areas of shifting ag.

7:02-03 alternating narrow bands of shifting agriculture and broad areas of forest.

7:06 clouds

7:12 Great networks of estuaries, but visibility too poor to see vegetation.

7:15 Crossed coastline. Obvious parallel beach ridge pattern but details obscure. Sea looks muddy.

1963 Singapore

July 22 - Singapore

West end "almost uninhabited"
acc. Burhill.*Cordia cylindrostachya*Flight Singapore to Hongkong
in Comet - 4 left side
over wing.

5:27 am Takeoff

patches of rubber and coconut
plantation near airport.
also prawn ponds along
Strait of Johore. Some
mangrove swamps on Johore
side of Strait.Visibility immediately
impossible because of sun
shining on wing.

1963 Hong Kong

July 24 - Hong Kong Island

Mountains generally deforested, but green, with thin low scrub and grass, on lower slopes thickets of *Leucaena*, etc. Many trees around houses, mostly introduced. Pines planted but not doing well. Cultivated patches wherever sufficient soil.

Aberdeen side - dense pine plantations on slope, but only a few feet high. Photos (Kod.) of fishing boats. Upper slope are of bare rock.

Photos of harbor + floating restaurants.

On upper road many slopes covered by *Pennisetum purpureum* for cattle fodder.

On the Peak, exposed slopes are rather grassy, rock cliffs bare. more sheltered slope have tall ^{clonal} scrub or scrub forest. *Pinus massoniana* common said to be native.

Upper slopes of Mt. Parker are grassy.

Hong Kong

Plants seen

Aleurites moluccana
Lantana camara
Pennisetum purpureum
Leucaena glauca
Hibiscus rosa-sinensis
Delonix regia
Panicum maximum
Lantana camara
Erythrina variegata
Ipomoea cairica
Plumeria rubra
Eleusine indica
Cyperus rotundus
Cordia alliodora
Chevillea robusta
Gerbera jamesonii
~~*Arenaria*~~ *tuberosa*
Solanum nigrum
Ficus elastica
Mussaenda erythrophylla
M. dora-dora
Caladium bicolor
Solanum pseudocapsicum
Monstera deliciosa
Zinnia elegans
Portulaca oleracea
Euphorbia hirta
Cassytha filiformis
Ficus microphylla
Catharanthus roseus
Thevetia peruviana
Beloperone guttata
Asparagus sprengeri

1963

Hong Kong

Hymenocallis littoralis
Gomphrena globosa
Tricholaena rosea
Sterculia lanceolata
Cypripedium calceolatum
Casuarina equisetifolia
Leistneria chinensis
Cynodon dactylon
Neium indicum
Coleus scutellarioides
Allamanda cathartica
 var. *hendersonii*
Codiaeum variegatum
Phoenix roebelinii
Antigonon leptopus

July 24

Air trip - Hong Kong - Tokyo at side of Pan Am. Clipper.

The New Territory - lower slopes badly scarred by erosion and quarrying.

Upper slopes mostly grassy.

At this season these slopes are green, even

The coast of China north of Hong Kong is very intricate, with linear ranges protruding as capes into the China Sea, with some of them breaking into islands. Reddish-tawny beaches, very wide, extend in shallow

Hong Kong

crevices between these capes. There are lagoons and estuaries or large inlets back of some of these beaches. Several are bar beaches connecting islands to mainland. Too far away to make ^{out} much detail. Also clouds.

July 24 - Niihau from air. South end flat, green, briar forest? West part of ~~south~~ north half of south half has some completely bare areas. North end also briar forest. Clouds piled up over cliffs on east side of north half and trailing out down west slope.

Oahu - there still seem to be some areas of the briar forest on the Ewa coastal plain intact - can be reached via plantation roads, s. of Kaneohe.

July 26 - Cull Canyon,
back of Castro Valley

Dry hills, stream
dammed up to form a
small lake for swimming
and boating. An East Bay
Regional Park.

On the hill west of the
lake is an old orchard.
Toward the head of it
and up a small side
canyon are large
Eucalyptus globulus,
and along the west side
of the canyon of the lake
itself are *Quercus*
agrifolia. The hills
are covered with thin
dry grass and a few
weeds. On one area,
west of the lake, is a
poor-looking plantation
of small pines. Along the
lake *Matricaria matricar-*
ioides, *M. inaequalis*,
Picris echioides, etc.

Along small trickle of
water in side canyon
are quite a number of
plants, all with possible
exception of ^{*Cyrtanthus* sp.} *Cyperus* sp. and
Eleocharis sp. are Mediter-
ranean weeds, as are all
the other plants seen, except

a few straggling plants of
Baccharis pilularis and the
live oaks, also a few small
unhealthy *Umbellularia*.
The green plants, except
the latter three, ~~and~~ and
the pines, eucalypts, and
orchard trees, are either
weedy composites or
are along the trickle of water.
The surface of bare
ground, where undisturbed,
has, in places, a white
efflorescence - probably
quite alkaline.

The bottom of the lake
margin is very muddy,
black when stirred up.

Should be possible to
establish a sod of
Eleocharis or something
of the sort, to keep the
mud fixed. The margins,
themselves, could be
covered by *Lippia nodiflora*.

July 30 Rio Piedras

Cultivated plants seen:

*Heterosia purpurea**Zamia* sp.*Pedilanthus tithymaloides**Polyscias* sp. (ends of leaflets
truncate, terminal leaflet
may be divided almost
to base.)*Dracaena fragrans**Polyscias ficifolia**P. tricholeuca**Alpinia purpurata**Jatropha* (large fld., leaves
very diverse)*Catharanthus roseus**Ixora* (lvs. sessile, oblong-
obovate, acute, base
subcordate, corolla lobes
acute)*Jasminum multiflorum**Peperomia obtusifolia**Dierfenchia picta**Cochlospermum variegatum**Caladium bicolor**Ruta graveolens**Phyllodendron bipinnatifidum*

(Red fld., ananth.)

*Coleus scutellarioides**Portulaca* sp. (sterile, doublefls. 1.5 cm, across, yellow,
lvs. flat oblong, appressed)*Tabernaemontana coronata**Ixora* cf. *chinensis* (rose pink fl.,
large panicle)

Weeds

*Vernonia cinerea**Pilea microphylla**Euphorbia prostrata**Euphorbia* cf. *glomerifera**Eleusine indica**Euphorbia heterophylla**Phoenix* cf. *dactylifera**Phoenix roebelinii**Acalypha wilkesiana**Cocos nucifera**Hymenocallis complanata**Cassia fistula**Saintpaulia (ordinaria)**Anthurium (ordinaria)*cult. *Sandwichia nobilis**Plumbago auriculata**Ficus "mandurata"**Psidium guajava**Persea americana**Chrysobalanus icaco**Manihot esculenta**Musa sapientum**Saccharum* sp.*Bixa orellana**Chrysophyllum cainito**Gnaphalium pectinatum**Ficus elastica (variegata)**Polyscias guilfoylei**Peperomia zonalis**Stenotaphrum secundatum**Wedelia trilobata*

all typed

44140

1

1963 Puerto Rico

July 30 - Rio Piedras

Phyllanthus

weed in garden

July 31 - Maricao Fish Hatchery, 1.5

1 41 *Montezuma speciosissima*
in secondary scrub forest2 42 *Blechnum occidentale*
common on cut banks along trail.2 43 *Adiantum*
common on cut banks along trail.July 31 Bosque Estatal de Maricao,
about 6 mi. n.e. of San German
in scrub forest on serpentine2 44 *Simarouba*
occasional5 45 *Guettarda*
occasional2 46 *Guettarda*
rare2 47 *Podocarpus*
common

Bosque Estatal de Maricao

48 July 31 same, about 8 mi. n.e.
of San Germanon road cuts in deep ^{red} laterite1 48 *Spermocoe*
common2 49 *Spermocoe*
common1 50 *Drymaria*
common

km 2 n. of Maricao

510 m.

↓

slender tree 8 m. tall; flowers
light brick-red.
young leaves bright red.

young fronds reddish.

Las Tetas de Cerro Gordo,

875 m.

↓

small tree 3-4 m. tall.

small tree, flowers white

~~small~~ large shrub,
flowers whitish.small tree, 4 m. tall,
(others to 3 m.); receptacle of
ripe fruit swollen, fleshy,
dark red; fruit darker red.

800 m.

↓

soil

leaf veins prominent beneath,
deeply impressed above. flowers white.
leaf veins not especially
prominent nor impressed. flowers white.
diffuse plant; ripe pedicels
fleshy, glutinous, caducous

July 31 - San German area.

Cult. spec.

Hura crepitans

~~Lagerflora~~ *Homoea fistulosa*

Artocarpus altalis

Albizia lebbek

Peltophorum ~~brunzeum~~ *brunzeum*

Delonix regia

Tricholena rosea

Mangifera indica

Cassia grandis

Roystonia regia

Clerodendron thomsonii

Euphorbia pulcherrima

Beloperone guttata

Nerium indicum

Nerium oleander

Lagerstroemia speciosa

Antigonon leptopus

weeds

Digitaria insularis

Paspalum fimbriatum

Pennisetum purpureum

Eugenia jambos

Commelina diffusa

Momordia charantia

Breynia nana

Chloris inflata

Gomphrena (same as Guam)

Triumfetta martinicensis

Ruellia longifolia

Trianthema portulacastrum

Echinochloa colona

Serpentine area

Gliricidia sepium

Coniostadium dodonaea

(poisonous anacard.)

Psidium guajava

Brysonia cuneifolia

Petitia domingensis

Cordia sp.

forms a scrub,

partly opened up by grazing, where not grazed, continuous, in ravines ~~also~~ approaches scrub forest.

The *Petitia* heavily infested with a branch parasite.

Tillandsia recurvata is abundant on all trees.

Patropia garrykifolia

Hibiscus tiliaceus ?

Leucaena leucocephala ?

Andropogon glomeratus

Malva minoriflora

Laterite or laterol on
hill on serpentine.

Blanketed with two
species of *Gleichenia*,
one of *linearis*. with
scattered *Calophyllum*
antillanum shrubs
and *Eucalyptus* trees.

Pinnic ground -

scrub forest - very mixed
Chrysophyllum, *Podocarpus*,
Cordia, ~~*Cordia*~~ *Clusia*,
Tabebuia, *Plumeria alba*,
Coniocalium glabrum, *Trema*
lamarckiana, *Guarea*,
Piptadenia, *Citharexylum*
fruticosum, *Cappella*,
Bidens leucantha,
Pitcairnia o
Acchinea

From tower - west the hills
are mostly serpentine and
scrub-covered. Eastward
a very considerable area of
mountains, mostly wooded
with low montane rain
forest, some clearing, more
in distance. In this forest
a few trees are bare.

Other side of ridge -
deep red soil

Elephantopus nudiflorus
Sauraueria sp.
Paspalum conjugatum
Sida rhombifolia
Sida acuta

Maraca Fish Hatchery
many things planted
as ornamentals

Monstera deliciosa
Allamanda cath. v. hendersonii
Chrysalydrocarpus lutescens
Montezuma speciosissima
Clerodendrum speciosissimum
Duranta repens
Zithronia diversifolia
Terminalia catappa
Rubus rosaceifolius
Lantana camara
Zehria pendula
Cordyline puticosa
Colocasia esculenta
Coffea arabica
Bambusa arundinacea (only)
Casuarina equisetifolia

Clerodendrum fragrans

Bahia Fosforescente - e. of
Parquera. The bay, itself
is surrounded by a narrow
mangrove fringe. Also some
mangrove cays in front. The
coast to the west has a rather
steep rocky shore. A string
of summer cottages being gradually
extended from Parquera, but has
not reached the bay. The bottom

Aug. 1 - south of San German.
on way to Guanica

~~Be. Phleb.~~

Phlebotenia cowellii
very rare Polygalae.

Parthenium hysterophorum
Prosopis cf. pallida
Albizia lebbek
Carica papaya

Hills with open
microphyllous forest of
savanna. sparse on lower
slopes. locally closed on hills.

Bumera, *Prosopis*, *Bucida*
etc. *Euphorbia antiquorum*
hedges. *Crescentia cujete*
on limestone. On these
limestone hills closed
scrub with many vine.
locally open scrub forest.

Head of valley - open
forest to savanna of *Prosopis*.
Epiphytic Tillandsia
cf. recurvata common in all
of these forests.

Argemone mexicana

Thespesia populnea

is thick grass. Fish population
large. *Thespesia* spectacular
even on bright moonlit night.
Probably dependent on delicate ecol. balance.

July 31 - 8 km. n. of Sabana Grande, n.e. of San Germán, in open ^{thin} serpentine soil

44151

Spermacoce

common on steep exposure

3 52

Spermacoce

common on flat or sloping

1 53

Diodia

occasional on flat or sloping

same - on deep red soil on serpentine

3 54

*Lycopodium*common in ~~grass~~ tangle of *Glechhonia*

2 55

Emilia sonchifolia

common on roadside

Aug. 1 - San Germán

Interamerican University Arboretum

3 56

Olyra (said to be *Anthrostyidium*)

local

Aug. 1 - hill just east of Guánica, on south coast.

3 57

Pisonia albidula

rare tree in xerophytic scrub

Aug. 1 - beyond Playa de Caña Gorda,

3 km. s.e. of Guánica

3 58

Gossypium hirsutum L. det. Fryxell

in open maritime scrub

(To p. 92)

750 m

flowers white.

flowers white.

ground

ground

flowers very pale lavender or whitish.

flowers purple, only slightly exerted.

90 m.

canes 1-2 m. long, mottled with purple when young, from a root crown.

100 m.

small tree, 15 cm. dbh, 5 m. tall, abundant fruits on ground beneath, large leaves from sprouts.

forest

shrub 1 m. tall, branches rather erect.

Guánica forest - just east of Guánica

Large areas on coastal hills covered by a scrub forest - closed, microphyllous, semi-deciduous to deciduous forest somewhat thorny, some *Cereus* species, several thorny legumes, *Conocladium dodonaea*, *Bursera simaruba* common. *Pisonia albida* rare. *Tillandsia recurvata* very common on some species.

Spacing 1-2m. ht. $\pm$ 5m.

At Guánica, a broad bare salt flat back of a narrow mangrove belt.

East along coast - a semi-open xerophytic scrub to scrub forest - an arborescent *Opuntia* locally common.

Mangroves around a small bay. Rocky bluffs with sparse scrub.

Photos
to W
end road.

The plain bet. San German + Mayaguez is flat, mostly in sugar cane, with a few ditches and streams. *Bambusa* sp. (*vulgaris*?) is very prominent in the landscape, forming graceful clumps, rows, lining streams, etc.

March back of Mayaguez with *Typha*, *Cyperus*, etc.

Mayaguez: ornamentals:

Ruellia equisetiformis

Lantana camara

Rhaphidophora aurea

~~But~~ *Paulinia*

lf. shallowly emarg. broad, fl. red 3 stamens.

Ficus pumila

Ficus microcarpa

Cordyline guineensis

Zea mays

Mussaenda erythrophylla

Mussaenda cf. *sericea*

Rhoeo spathacea

weeds:

Malvastrum coccineum

Tridax procumbens

Euphorbia hirta

Vernonia cinerea

Cyperus rotundus

Posoquenia latifolia

Veitchia merilliana

Petrea (shrub)

Irona pinelapensis

1943 Puerto Rico

Aug. 1 - Mayaguez,
University campus
cultivated as an ornamental

44159 *Mussaenda*
3

1 60 *Hibiscus* ~~lancea~~

1 61 *Posoqueria latifolia*

Aug. 4 - 5 m. s.w. Caguas

62 ~~*Spermocoe*~~
common on weedy area

Aug. 4 - 1 km. n. & of Las Cruces
- 8.5 km. s.w. of Caguas

2 62 *Spermocoe*
common on weedy roadside
on clay soil.

Aug. 4 - n.w. of Punta Cubano
east of Vega Alta

2 63 *Spermocoe*
common on grassy roadside
on limestone soil

2 64 *Randia*
common in scrub on lower slopes of
limestone "mogote" or hill.

2 65 *Chiococca racemosa*
common in scrub on lower
slopes of limestone "mogote" or hill.

40 m.
↓

8 m.

shrub 2.5 m. tall,
enlarged calyx lobe white;
fruit immature.

tree with erect trunk,
flowers brick red (lying on
ground).

tree 6-7 m. tall, abundantly
flowering, buds zygomorphic
flowers in rather fan-shaped
downward directed spray,
collars white, not ~~asymmetric~~
zygomorphic when open.

450 m.

erect; flowers white.

70 m.

75 m

shrub; flower white;
fruit immature.

75 m.

semiscandent shrub;
fruit white, fleshy.

Aug. 2 - trip by auto
Mayaguez to Rio Piedra -
Plain north of Mayaguez
in sugar cane - many fields
submerged by rain. Rio Casci
red and thick with mud.

Cerro La Cadena - largely
denuded, grassy with scattered
trees, patches of wood or scrub
esp. in ravines + valleys.

These hills are bedded, shaly.

The forest is a mixture
of *Cecropia*, *Artocarpus*, *Mangifera*,
Rapanea, *Ochroma*, *Bambusa*, -

some coffee plantation. *Musa*.

Limestone hills around r.e. of
Victoria are generally scrub-
covered - well developed karst
Leucaena is an important component.
Some seem to have less
disturbed vegetation, scrub forest.

The limestone seems to
be a rather argillaceous
type, yellowish, earthy.

Then a rolling semi-open
area. Commonest trees are
Artocarpus alticola + *Mangifera*.
Cassia spectabilis, *Delonix*,
(Bet. *Corralis* + *Mora*.)

Roads generally lined by trees.
Pasture, cane, maize, some bananas,
papayas.

Quisqualis indica

Before Guajataca beach,
a gorge through limestone.
Then a good view
westward from point
where there is a shelter
and picnic tables.

Vegetation being cleared
by park dept.

East of this a largely
cleared rolling area.
Some low limestone hills.

To right a large area
of karst hills a *mozote*,
closer and closer to road.
but also lower and more
rounded. Road follows a
rolling terrace, cleared, mostly
with very thin soil, in poor
pasture.

Alcantarilla

Gynerium local along stream.
Delonix very common along
road. Also *Albizia lebbek*,
Lamanea more rare. *Thespesia*,
Terminalia catappa. *Cocos*.

Beyond Arecibo, to right in
distance a very impressive
karst. Large flat area of
cane plantation this side of
the hills. River smaller + muddy.
Marshes with taro along it.
Terminalia catappa very
common along roads.

Karst approaches immediately along road about opposite airport. Scrub-forest-covered. Some red soil. Lower slopes of some clear. Scattered *Casuarina equisetifolia*. *Cassia spectabilis*, *C. grandis*? *Delonix* along rd.

Road enters "Haystack Hill". Here the mogotes are more isolated with flat ground between some of them. Some rather large sink-hole valleys - probable fields in them. Also sugar, etc.

This terrain, with scattered mogotes, continues for some distance. Appears to be a long valley with mogotes strung along on both sides.

Then only on right, sand dunes, fully vegetated, on left.

Vega Baja.

Road continues with mogotes on it, sugar cane on left.

Rio Cibuco very muddy.

Then through ~~to~~ a patch of very good mogotes, into a flat valley surrounded by karst ridges.

Vega Alta.

The limestone east of Vega Alta is very argillaceous pinkish red.

Very spectacular mogote on left.

Aug. 3 - east from San Juan by road - all the lower hills are cleared and grassy - sugar cane on some of lowest, as well as on flat coastal terrace and valley bottoms.

Hedgerows & roadsides of trees. clumps of bamboo in fields.

Cap San Juan peninsula grassy hills, largely built up. Coconut groves on flat places. Small mangrove swamps with *Rhizophora*, *Laguncularia* & 2 spp. of *Avicennia* in inlets, as at Dorco.

Maritime scrub of *Gossypium hirsutum*, *Leucaena*, *Indigofera*, etc. Dwarf scrub of *Borreria capitata* with *Sporobolus caprae*, *Heliotropium curassavicum*, *Stachytarpheta jamaicensis*, *Crotalaria mucronata*, *Lespedeza*, etc.

The coastal area around the east end of the island is in pasture and cane -

depending on the terrain. Cane is planted on some rather steep slopes and generally hilly ground, but not to very great altitudes.

The valley complex around Yabucoa is flat, entirely planted to cane. South of Yabucoa the road crosses the Cuchilla de Pandura, a rugged granite range with the slopes a jumble of enormous granite boulders with, here and there, hidden

torrents of water rushing down between them. Would be worth a serious collecting trip.

Just east of Guayama the landscape begins to show some signs of aridity - Prosopis + other microphyllous trees - shrubs. Rapidly becomes more so.

From somewhat east of Ponce west to beyond Guayanilla, even though the general landscape is arid, there are large areas of marsh -

mainly very tall Typha perhaps 3 m. or more, and locally other marsh species.

Back of the marsh is cane. Some spots in the marsh are very saline. Along the

shore considerable areas are fringed by small mangrove swamps.

The beach at Ponce is lined by warehouses and other unsightly structures. At Guayanilla is a huge refinery and a chemical plant. A super-highway along this coast (under construction) is ruining most of the features of the shore. Weekend shacks take care of the rest.

Aug 4 - auto trip, Ponce - Coamo - Aibonito, Larey-Caguas, Bayamon.

This entire route is essentially cleared. Cane occupies flat land and low hills at least almost to Coamo.

Above the cane the land is mostly in pasture with scattered trees, patches of wood in ravine, and rows of trees along roads. These vary from place to place, but Delonix is a constant component. At higher altitude, Bursera is common. Toward Caguas and on toward Bayamon Erythrina is found.

Aug. 4 - beach 1.5 mi. e. of
Punta Boca Juana
on fine slope of low dune
ridge above beach

44166 *Cabildo lanceolata*
common locally

2 67 *comp. Melanthera nivea* (L.) Small - det. H.E. Robinson, 1974
common

4 68 *Sporobolus*
abundant

Aug. 5 El Yunque
in upper montane, mossy
forest

2 69 *Lauvagesia erecta*
common along trails

1 70 *Cochlidium serculatum* (Sw.) L.E. Bishop det. Sellsinger 1978
common on tree trunks

2 71 *Lobelia*
common along trails in openings

1 72 *Trichomanes rigida*
common on cut banks
and wet cliffs.

1 73 *Rhipidopteris peltata*
common on tree trunks

2 74 *Psychotria*
occasional on tree trunks

2 75 *Polyphodium*
locally common on tree trunks

3 76 *Vittaria*
locally common on tree trunks
(To p. 106)

3 m.

fleshy, much branched;
flowers white.

semi-prostrate,
extensively branched,
heads white.

erect branches from
deeply buried rhizome.
leaves flat, slightly
glaucous.

900-1050 m.

↓

flowers white

herb 1.5-2 m. tall, flowers
greenish to deep purple.

vine, leaves rather fleshy;
infl. reddish; buds white.
fronds curved downward

Aug. 4 - Mogotes east of Vega Alta - the vegetation varies from a dense scrub to a dense scrub forest with little herbaceous growth. One mogote that was cut by the road is white and chalky inside, of varying hardness from completely soft powder to rock that cannot be scratched with fingernail. Honeycombed with holes in which some sort of small animal lives, not seen but holes look used. (sample)

Somewhat farther east, near Puntos Cubano, another hill is cut by road - here also the material is soft, but earthy and reddish, with globes of reddish clay (sample). Many seem to be like this, and are readily demolished by steam shovels, etc.

Some palms in the vegetation on these. (photos)

Aug. 4 beach east of Dorado and Punta Boca Juan.

Brownish sand with considerable broken up shell fragments. A continuous low dune ridge about 3-4 m. high is back of the beach and separates it from the mangrove swamps and marshes. On the ridge is Coccoloba. On its front slope are Sporobolus, Calid, Medanthera, etc.

In the Coccoloba scrub is abundant Caesalpinia cristata (v) (large stipules).

Aug. 5 - El Yunque

Wind sheared mixture of

Ocotea spathulata

Eugenia brinquensis

Haenianthus obovata

Celopogonium squamulosum

Tabebuia rigida

on exposed places.

In protected areas the same but larger trees with *Cyrilla racemosa* + *Magnolia splendens* + *Micropholis garcinifolia*.

But 90% of area is

completely dominated by *Euterpe globosa*, (photo) which seems to be a successional stage resulting from hurricane damage.

(Wadsworth says after a hurricane ~~about~~ fully 90% of woody plants broken or uprooted (not just limbs broken))

This damage is in localized areas - some areas as low as 30%.

Immediate result is *Rhynchospora* + *Scleria canescens* dominance

or, if seed available, *Cecropia peltata*.

Palms replace these.

These may be destroyed by landslides, also by hurricanes to some extent.

Patches of *Cecropia* scattered here and there in palm forest.

Along the ridge toward South Peak are patches of open mossy scrub in a drier type of mossy forest, and small patches of open sedgey land with 3 spp. *Utricularia*, 2 spp.

of *Lycopodium* (*L. cernuum*, *L. cf. carolinianum* - same as that in Trinidad savanna) 2 or 3 spp. *Xyris*, 2 spp. *Rhynchospora*, *Elescharis* sp., *Scleria villosa*, *Isachne* sp., *Panicum pauciflorum*.

Said to be hardpan 1 ft. or more down in each of these open types - iron-pan. Soil is clay and fine sand.

Downward the palm forest gives way gradually to sclerophyll and orthophyll trees till, at 1800' or so there is a typical lower montane forest, with many epiphytes but not moss-covered as is that on ridges farther up.

This, even on ridge-top, is rather tall (up to 35 m) and with rather ~~thick~~ large trunks, to 5 dm dbh.

Less damaged on ridge than in valley bottoms, judging by number of palms and general good condition of forest on ridges.

Very good along Big Tree Trail.

- 44177 *Peperomia quadripinata*
occasional on tree trunks
- 2 78 *Thelypteris*
local on cut bank above trail
- 2 79 *Blechnum fragile* (Liebm.) Morton & Killinger
det. DBL 1979
local on cut bank above road
- 2 80 *Blechnum fragile* (Liebm.) Morton & Killinger
det. DBL 1979
~~local~~ common on
cut banks above trail
- 1 81 *Grammitis*
rare on tree trunks
- 3 82 *Psychotria*
common in understory
- 1 83 *Blechnum divergens* (Kunze) Mett.
terrestrial
- 2 84 *Adenostemma* *Adenostemma verbesina*
(L.) O. Kuntz - det. H. E. Robinson, 1974
common along trail
- 3 85 *Blechnum fragile* (Liebm.) Morton & Killinger
occasional, climbing
on tree trunks.
- 1 86 *Hillia parasitica*
common on tree trunks
- 4 87 *Psychotria*
occasional in undergrowth
- 2 88 *Cordia glabra* *borinquensis* Urb.
occasional in scrubby
forest on ridge
- 2 89
between stones on road
- 1 90 *Scleria canescens*
very abundant in roadside
growth in open parts

creeping; fruiting spikes rare.

det. DBL 1979
Killinger, 1978
young fronds distinctly
reddish.

det. DBL 1979
Killinger, 1978
young fronds not
reddish.

det. Killinger 1978
shrub 4 m. tall (others
taller), ripe fruit black.

heads whitish, erect.

det. Killinger 1978
rhizome climbing;
young fronds with only
the faintest suggestion
of pink.
shrubby epiphyte.

shrub 1 m. tall foetid
when broken; collar white.
small tree; fruit green.

forming dense mat;
flowers tiny, white.
forming low tangles,
very scabrous, cuts skin.

same - in ~~semi~~ open
sclerophyll ridge-top
forest

44191 Calyptranthes

4

common

2

92

Psychotria

occasional in edge of

1

93

Lycopodium tasifolium

rare in edge of open

forest, on fallen tree

1

94

Grammitis

common on tree trunks

in edge of

1

95

Blechnum

occasional

3

96

Nephrolepis Rivularis (Vahl) Mett. ex.

occasional on tree trunks

det. Sellinger, 1948

same - in small

wet open patch,

dominated by sedges

1

97

Scleria villosa

occasional

2

98

Rhynchospora cyperoides

common

3

99

Rhynchospora

common

44200

Xyris

3

locally common

1

01

Xyris

occasional

1

02

Xyris

rare

1000 m.

↓

shrub 2.5 m. tall.

shrub 1 m. tall

corollas white, fruit green.

young fronds reddish green.

Krug.

fronds pendent;
tubers none.

1000 m.

corollas yellow

1963 Puerto Rico

Aug. 5 - beginning of
Big Tree Trail, El Yunque44203
6*Psychotria ebracteata*
locally common

MAMEYES

Aug. 5 - Rio Mameyes, 1.5 km.
S. of Mameyes3 04 *Hernandia sonora*
very local along
streamAug. 5 - Dorado forest,
just back of beach n.w. of Dorado1 05 *Acrostichum aureum* L. (det. Sellinger 1978)
in fresh-water marshy place1 06 *Mulpighia coccigera*
common in undergrowth

900 m.

shrub 2 m. tall,
corollas greenish white,
campanulate lobes
appendiculate; fruits
immature (said to be
bright blue when ripe).

20 m.

tree 8 m. tall; flowers
grayish green; fruiting
envelope with orifice
not toothed.

1 m.

acaulescent; young
fronds not at all reddish;
fertile fronds fertile only distally.
shrub 0.6 m. tall, petals pink.

Aug. 6 - Dorado

Coastal forest (+75 acres)

*Calophyllum antillanum**Acrocomia**Roystonea elata**Sideroxylon foetidissimum**Bucida buceras* (deciduous)*Diospyros ebenaster**Mammea americana**Pimenta racemosa* var. *grisea*

(understory)

Bursera simaruba (decid.)*Clusia rosea**Nectandra caribaea* (understory)*Manihara* ~~mitis~~ *bidentata*

This forest has had
the shrub layer removed.

Acrostichum danaeifolium
said to be freshwater
form, fertile fronds only fertile
above, areolation different.

*Pterocarpus swamy**Pterocarpus officinalis**Bucida buceras* are
the dominant.

(photos)

extensive buttresses
no herbs except ~~for~~

seedling on knees.

Aug 10 - Hawksbill Mt.

A road has been built to the summit, taking off from Skyline Drive at just beyond m.p. 47.

At the top a shelter, "Bryd's Nest no. 2" has been built, surrounded by a picnic ground and with vegetation cleared between it and the cliff, along the edge of which an unsightly cable is stretched. The ground has been leveled, gravel paths and picnic tables installed, and on the extreme summit a stone enclosure has been constructed for viewing the landscape. East of this an acre or two of forest has been cleared, to assure a view in that direction. Just below the enclosure a tiny rather bedraggled patch of *Spiraea latifolia* var. *septentrionalis* still hangs on. The *Potentilla laxifraga* and *Solidago* are still common locally on the rocks. Many firs, especially on exposed open rocky areas, are dead.

Young ones are common in the forest and many of the older ones in the forest are dead.

Aug 11 - Big Meadows Swamp
Openings in the thickets of *Betula*, *Crataegus*, *Pyrus*, *Corylus*, etc., are choked with a scrub 1-1.5 m. high of *Spiraea latifolia*, *Lyonia ligustrina*, *Rosa palustris*, locally pure stands of *Cornus penns.* Where the scrub is thin there are

- c *Epilobium angustifolium*
- o *Sambucus canadensis*
- c *Sanguinaria canadensis*
- r *Veronica virginica* (white)
- o *Achillea millefolium*
- c *Onoclea sensibilis*
- c *Vernonia* cf. *noveboracensis*

In open places is a herbaceous growth of *Sanguinaria*, *Carex*, *Epilobium* sp., *Solidago rugosa*, *Scirpus* sp., *Caltha palustris*, *Pyrus* cf. *arbutifolia*, or *melanocarpa*, and a grass. In the lowest part *Lobelia cardinalis*, *Galium* sp., *Juncus* spp. and *Sphagnum*, with a colony a few feet across of *Menyanthes trifoliata*. This lowest spot was muddy but had no standing water at all.

The ditches in the edge of the swamp have wet soil but no water.

116

1963 Virginia

✓

Aug. 10 - Skyline Drive
just south of Dickey Ridge
Visitor Center

44207

Vitis

1

very common on trees in
edge of forest

1

08

Vitis

occasional on trees in edge
of forest

✓

Aug. 10 - Old Rag View, Skyline
Drive east of Hawksbill

5

09

Lycopodium tristachyum

thriving colony in open scrub forest

2

10

Lysichiton cf. alba

roadside in parking overlook.

✓

Aug. 10 - Skyline Drive at
Entrance to Hawksbill Fire Rd.
S. of milestone 47.

1

11

Habenaria

in moist boggy patch beside road

1

12

Solidago

common along road embankment

✓

Aug. 10 - South ~~west~~ slope of
Hawksbill Mt.

1

13

Solidago cf. odora Ait.

local in crevices of rock outcrop

3

14

Rhododendron

rare in forest

Shenandoah National Park 117

660 m

woody vine, leaves dark
green above, glaucous beneath.

Woody vine, leaves green
beneath.

1120 m

rhizome deeply buried,
spikes erect.

corolla white, stamens
purple, exserted.

1020 m

flowers white.

flowers yellow; leaves
aromatic when broken.

1400 m

leaves aromatic when broken.

shrub 1.5 m. tall, glaucous.

118

1963 Virginia

✓

Aug. 10 ^{with} Upper Hawksbill Trail,
~~east~~ slope of Hawksbill Mt.
 in hardwood forest on
 rocky ground

44215

(umbell)

occasional

1

16

(umbell)

rare

1

17

(umbell)

locally common

3

18

Pseudotaenidia montana

very local

4

19

Zizia Thaspium trifoliatum (L.) Gray
common in openings

1

19a

Aquilegia canadensis

Aug. 10 Summit of Hawksbill Mt.
 at tops of greenstone cliffs

X1

20

Solidago canadensis v. *monticola*
common in rock crevices

X1

21

Maianthemum canadense
locally common

Aug. 10 - south ridge of
 Hawksbill Mt.
 in woods

X1

22

Clintonia

rare

X1

23

Thelypteris dryopteris
 local colony in woods,
 rhizome deep between rocks

Aug. 10 Summit of Hawksbill Mt.

X1

24

Heuchera

in rock crevices in woods

Shenandoah Nat. Park. 119

5000 m.

herb 1 m. tall, odor of celery

leaves thick, some plants purplish.

sepals and spurred, petals and
stamens yellow

200 m.

flowers yellow

sterile

nearly erect

44225

X2

Barbarea ^{vulgaris} ~~serotina~~ ^{off. var. sylvestris}
occasional in picnic ground

Aug. 11 - South slope of
Chapman Mt. north of
Rapidan River

on dry slope in *Quercus prinus*

✓3 26 *Aureolaria laevigata* Raf.
common

X1 27 *Aureolaria laevigata* Raf.
occasional

~~Aug. 11~~ Aug. 11 - Horner Camp,
Mill Prong of Rapidan River

28 *Holidago* in hemlock
forest in rocky
bottom of valley

X1 28 *Holidago*
common locally

X1 29 *Carex*
on dry roadside

X1 30 *Mitchella repens* L.
common under hemlock

5 X 31 *Ilex montana* T. & G.
in undergrowth

X5 32 *Laportea canadensis* (L.) Wadd.
common

X1 33 *Impatiens capensis*
common in opening

460 m.
1500'

forest

stem single or several from
base; corolla yellow.

stem green; corolla yellow.

760 m.
2500'

flowers yellow

culms spreading, arching.

prostrate, forming loose
mats, this year's fruits
green, immature, some of
last year's persisting, scarlet.
shrub 2-3 m. tall, arching;
fruit green.

erect stinging herb;
inflorescence racemes somewhat
swollen, fleshy; fruit fleshy.
much branched herb, to 1.5 m.
tall, flowers orange marked
with red; fruit green,
dehiscing elastically.

122

1963 Virginia

- 44234 *Galinsoga ciliata*
occasional
X₁
X₂ 35 *Veronica officinalis*
on roadside
X₁ 36 *Amphicarpa bracteata* (L.) Fern.
weedy roadside

Aug. 10 - below Boyler Gap,
headwaters of Rapidan River

- X₂ 37 *Vitis aestivalis* m. *argentifolia*
on bushes by roadside (Thunson) Fern.

Aug. 11 - Big Meadows ~~Forest~~
edge of swamp

- X₂ 38 *Salix humilis* Marsh.
occasional in meadow at
X₁ 39 *Epilobium*
common in ditch in
X₁ 40 *Epilobium*
common in ditch in
X₂ 41 *Galium*
occasional in open ditch in
X₆ 3+3 42 *Gratiola*
common in open ditch

- X₁ { 43 *Corylus cf. americana*
X₁ { 44 "
X₁ { 45 "
X₁ { 46 "
X₁ { 47 "

common in semi-open scrub in

- X₁ 48 *Corylus cornuta*
rare in semi-open scrub in

- X₄ 49 *Juncus*
common in open ditch in

Shenandoah Nat. Park 123

760 m.

rays white.

prostrate, spikes ascending.

twining; corolla lavender,
calyx almost white.

woody vine; leaves very
glaucous beneath.

shrub 1.3 m. tall.

erect, flowers pink.

erect, flowers pinkish.

erect, bushy, corolla 4-lobed, white.

stems fleshy, procumbent,
flowers with tube yellowish,
limb white.

shrub

shrub 1-1.5 m. tall

- 44250 *Juncus*
X 4 common in open ditch in
same - in swamp
- X 1 { 51 *Corylus cf. americana*
X 1 { 52 " "
X 1 { 53 " "
X 1 { 54 " "
X 1 { 55 " "
X 1 { 56 " "
X 2 57 *Lycopus americanus*
in small opening in swamp
- X 5 58 *Veronica virginica f. virginica*
rare in small opening in swamp
- X 1 59 *Corylus cf. americana*
X 1 60 " "
X 1 61 " "
X 1 62 " "
X 1 63 " "
X 1 64 " "
X 1 65 " "
X 1 66 " "
X 1 67 " "
in swamp
- X 1 68 *Sambucus canadensis*
in small opening in swamp
- X 3 69 *Cirsium muticum* Michx.
in small opening in swamp
same - edge of swamp
- X 2 70 *Prunella vulgaris* " *lanceolata*
common in open ditch in
- X 1 71 *Cerastium semidecandrum* ?
rare in open ditch in

shrub 1.5-2 m. tall

" " "
" " "
" " "
" " "

flowers white.

erect herb to 1.5 m. tall,
flowers white.

shrub

" "
" "
" "
" "
" "
" "
" "

shrub 1.5 m. tall, flowers
cream white.

plant 2 m. tall, much branched
above, with many heads; tips of
inner phyllaries deep purple;
flowers rose pink.

calyx purplish, especially
on margins, corolla deep purple.
flowers white, small.

126

1963 Virginia

- 44272 *Scirpus cf. atrovirens* or *polyphyllus*
occasional along bank of open ditch
✓4
- ✓2 73 *Juncus effusus*
abundant in open ditch
- ✓5 74 *Hypericum punctatum* Lam.
local on bank of ditch
- ✓4 75 *Galium*
local on weedy bank of
open ditch
- ✓4 76 *Eleocharis*
abundant in open ditch
- ✓3 77 *Callitriche*
abundant in open ditch
on moist soil.

Shenandoah National Park 127

caespitose, erect, branches
of panicle drooping.
caespitose

erect, ~~se~~ flowers pale yellow

stems elongate
scrambling over weeds.

caespitose

prostrate, forming
small mats.

Aug. 16 - 3.5 miles s.s.e. of
 Mercersburg
 in thicket of *Ailanthus*
 with scattered larger
 trees of native hardwoods,
 thick weedy undergrowth,
 on flattish sandy loam
 soil.

44278

Lappula

occasional

79

Verbena

rare

80

Geum canadense

abundant

81

Chenopodium

common

82

Commelina

rare

Aug. 17 Powdermill
 Nature Reserve, Recta

83

Phlox paniculata

common very locally in wet spot in
 old field with herbaceous
 perennials,

84

Lobelia puberula

rare in ~~in~~ second-growth
 woods on rocky slope

85

Athyrium thelypteroides

occasional in woods on slope

86 (fern)

rare, in woods on gentle slope
 (cl. n. 132)

erect, ^{to 1.5 m. tall,} corolla white.

erect, flowers white

several to many stems
 from base, petals white.

flowers pale blue, 2 petals
 larger; anthers yellow, no
 dark connective.

1200'
 365 m.

erect flowers magenta.
 (inflorescence unusually
 narrow - whole population
 is this form).

erect; corolla blue-violet,
 with 2 white lines on lower side.

sterile

Powdermill

Cryptolepis fragilis
growing on old ash leaf
in bottom of an abandoned
~~house~~ house foundation where
rubbish was burned
last year. Thriving
colony. Not found
elsewhere in vicinity.

Artificial pond, fed by
springs and surface flow -
established Sept. 1961, filled
by 27-28 Dec. 1961.

Has golden shiners and
large mouth black bass.

Considerable flora of
emergent aquatics has
come in, incl *Typha*,
Mimulus, *Juncus*, *Eleocharis*,
Hypericum sp., *Leersia*,
Sagittaria

Old field, abandoned
10 years, dominated by
Solidago spp. with
various other herbaceous
perennials. common.

A scattering of *Crataegus* spp.
Populus cf. *canadensis*, *Prunus serotina*

but not enough to yet
change the character
of the vegetation

The reserve is available
for manipulation or manage-
ment in northern 300 acres -
southern 1200 acres is kept
undisturbed except for
slight disturbance along
roads and around cottages,
and for controlled deer
hunting, some mushroom
hunters & ginseng hunters.

On rocky bottomlands
along stream, in second
growth mixed hardwood
Euphrasium maculatum is
common (acc. G.H.).

The forest on bottom-land
is second growth - evidenced
by old rock piles with
trees on them.

Old sawdust piles ^{at least 20 years old,} from
portable saw mills, have
herbaceous growth - *Impatiens*,
Eupatorium rugosum, etc.

Forest on slopes with about
95% complete, but not very dense
canopy have almost no under-
growth and mostly ferns in ground layer.

44287

✓ 4

Thelypteris noveboracensis
generally abundant
in shaded edges of woods.

Aug. 20 - ~~road~~ near Fairview,
6 mi. n. of Mercer, Mercer Co.
Penn.

✓ 2

88

Dryopteris
common in patch of deciduous
woods on gentle ^{northerly} slope.

Aug. 21 - Mendon Ponds Park,
10 miles south of Rochester,
Monroe Co., N. Y.

✓ 1

89

Equisetum arvense
very common on slope
in deciduous forest.

✓ 1

90

Coptis groenlandica
abundant in ~~red~~ *Acer*
rubrum swamps

✓ 2

91

Eupatorium maculatum L.
common in marshy edge
of pond

✓ 3

92

Decodon verticillatus (L.) Ell.
abundant, tending to be
in pure stands, in water.

✓ 2

93

Cornus ^{*obliqua* Raf.} ~~*armonia* Mill.~~
very common in edges
of swamp

✓ 2

94

Cornus racemosa Lam.
very common in edges
of swamp

✓

rhizomes prostrate,
shallowly buried.

rhizome short, erect.

stems prostrate, bright
yellow.

erect, flowers ~~pink~~ dull
rose pink, stems
solid, reddish; panicle
tending to be flat topped;
older ~~flowers~~ ^{heads} in center
subshrub, stems very
spongy at base, branches
conspicuously arching,
flowers magenta.

shrub 1-2 m. tall; lvs. glaucous
beneath
fruits dull blue.

shrub 1-2 m. tall; cymes
red, leaves glaucous
beneath, almost ripe
fruit pale green.

Startech Camera
Eastman.

attachments from
Lester A. Dine Co.

102 Jericho Tpk.

Floral Park, L. I. N.Y.

127 film pinhole ~~exp~~ 8 to 2 inches

Second growth across
from museum - flat
ground - trees 2.5-10 cm
dbh. spacing 0.3-2 m.
ht. to 8 m.

trees *Crataegus*

Liriodendron

Acer rubrum

Cornus florida

Quercus cf. rubra

Carya sp.

Pyrus coronaria

Magnolia acuminata

Carthagenus
Hammamelis

scarcely any shrub layer

herbs (a) *Thelypteris noveboracensis*

(a) *Mitchella repens*

lc *Viola* sp.

lc *Carex* spp.

Potentilla cf. canadensis

~~*Asclepias*~~

lc *Polypodium acrostichoides*

o *Agrostis*

o *Eupatorium rugosum*

o *Urtica sessilis*

Aug 20 - north from
Pittsburgh to Erie -
the common old-field
shrub, especially
northward, is *Crataegus*.
Hemlock is common in
woods near Pittsburgh.
In the vicinity of Lake
Erie the woodlots are
characteristically
beech-maple but with
no conifers. The general
landscape is cultivated,
with scattered dense
woodlots. Occasional
neglected pastures with
scattered *Crataegus*.

Aug. 21 - Mendon Ponds

Red maple swamp. Tree
about 25 m. tall, maple
completely dominant, canopy
90-95%. Trees 3-6 m. apart
Asimina, *Vaccinium cf.*
corymbosum and a few
larger shrubs in 9 m. layer,
a little *sphagnum*,
much *Maianthemum*,
Coptis, toward edges
Parthenocissus in ground
layer, also *Dryopteris "spinulosa"*.
shrubs esp. *Prunus serotina*
form a definite shrub
layer, 1-2 m. tall near edges

The ponds have waterlilies, *Ceratophyllum*, etc. in great quantity in the smaller pond a large patch of *Nelumbo lutea*.

Edges of pond have areas of *Typha*, others of ~~vertical~~ *Decodon verticillatus*, with scrub of *Cornus* spp. around edges of this.

Another swamp is *Cornus* with much young *Acer rubrum*.

Conn
Mystic Marsh
(b.w. photos of marsh and area back of it - marina)

John Corbett
NPS Research reports

Higher up *Quercus alba* & *Betula lenta* are more abundant.

Mamacoke Island

b.w. Photos of salt marsh isthmus with woods on higher ground in background.
(Bull Conn. Arb.)
(reg. map.)

The marsh shows a sequence of *Spartina alterniflora*, *Juncus gerardi*, *Spartina patens*.

On Mamacoke gneiss on island is - *Quercus velutina* forest with other species

Q. alba,
Carya spp.
Prunus serotina
Fagus grandifolia

sparse shrub layer
Rubus spp.
Viburnum acerifolium

Locally a *Vaccinium* *Garryana* layer, fairly dense.
Thin ground layer of
Panthenocissus
etc

Beautiful rock ledges

138

~~1963~~ 1963 New York - Conn.
 etd. from p. 132

44295

✓2 *Cornus sericea* L.
~~common~~ in edge of water

✓2

96

Cornus sericea L.
 common in edge of swamp

Aug. 25 - Barn Island marsh,
 Conn.

in salt marsh

X1

97

Juncus gerardi
 dominant in outer part
 of salt marsh

X1

98

Limonium carolinianum
 common locally, in patches,
 with *halimolobos* and *Triglochin*

X1

99

Triglochin maritimum
 common locally, in patches
 with *Limonium* and *halimolobos*

44300

~~Agalinis~~

X1

very locally common

X1

01

Agalinis
 occasional, with ~~purple~~ lavender form

Aug. 30 - Amherst,

✓2

02

Marsilea quadrifolia L.
 forming a dense sod around
 margins of pond

Mass.

Monroe Co. N.Y.

139

sparsely branched
 shrub 1 m tall, flowers
 white. stems green, turning reddish.
 shrub 1.5 m. tall, stems
 red; flowers white.

leaves of flowering plant
 mostly dried up.

flowers deep lavender.

flowers white.

Mass.

fronds erect.

Aug. 25 - Pequot - Lepore Sanctuary

Aug. 25 Barn Island Marsh
Jones, in from alder thicket
1 *Panicum virgatum*
Spartina alterniflora

2 *Spartina patens*

3 *Spartina alterniflora*

4 *Juncus gerardi*
strip back of beach ridge
1 patch on further back.
Patches of *Rimomum* + *Triglochin*

Most of the zones are
quite patchy

Beach ridge has *J. v.*
+ locally *Rimomorphus*

Patches of dead and
dying grass evidently
due to salinity from
trapped evaporating sea
water. Advanced stages
are bare.

Marshes were ditched
to eliminate mosquito
breeding pools. This killed
the fish that controlled the
mosquitoes and created
more pools to breed more
mosquitoes. Ditching
has been abandoned and
ditches are gradually
filling. Many have
very small natural
leaves, impounding
more water.

The ditching has
broken up the zonation.

Occasional big boulders
scattered here and there,
also a strip of stones running
out to the edge. Slight
accumulation of higher
material around stones,
with *Panicum*, *Spartina*,
gulls drop beaks and
other shells on rocks to
crack them.

One small piece of
undoubted coal found
here. Looked as though had
been attached to a shell
or other smooth object.

Bottom of bay is sand.

A levee was built across the marsh a couple of hundred yards from the sea, to impound water. This changed the marsh from salt to fresh. *Typha angustifolia* and *Phragmites* came in and now dominate.

Aug. 26 - Bechley Bog
(photo (row) of *Nymphaea*
at edge of pond.

4 trees 1.5 - 2.0 dm dbh cut down by beavers (see photos) all ~~are~~ *Populus grandidentata*. These from 5 - 3 - 40 m. from edge of pond.

A plain of some width and about 1-2 m above lake level all along the east side, lined by a sort of ridge 4-6 dm higher than depression back of it. Large boulders in it. Could be a very old road worn into plain, leaving this rim. but no good traces

of road left if so. Trees up to 2 dm. aspens, red maple, hemlock etc on this area.

The plain, to 30 m. wide, is ^{very} gently sloping from foot of steeper slope, toward pond. Some large boulders on it. No very large trees. Toward north this narrows and becomes boggy.

In the bog part of the pond there are open bog areas and scrubby areas, irregularly distributed, apparently with no

Aug. 30 - Amherst, Mass.

Pond on campus, covered by azolla. Abundant *Walsbyella* forming a band in mud around edge of pond, up to 10 m. wide, blades emerged to 5-10 cm.

Aug. 30 N.W. Massachusetts - beautiful wooded mountainous country. Greylock Reservation should be a good place to study it.

1943

New York

Aug. 30 - near Albany

Rt. Interstate 90 ^{where} it separates from Rt. South and from there west for several miles is a vegetation of a shrub layer of *Quercus ilicifolia* with scattered trees of *Pinus cf. rigida*.

The pine stand varies in density, but the trees are not large. Where it becomes at all dense, even where the trees are separated by about crown width, the shrub layer becomes rather sparse.

This looks exactly from the road like the *Q. ilicifolia* - *P. rigida* vegetation on fire scars in the Shen. Nat. Park. No inf. on associated species. The soil appears to be sandy.

North of Amsterdam, along Thruway bet. there and Fultonville on river terraces, *Lythrum salicaria* is abundantly flowering.

N.Y.

The Montezuma National Wildlife Refuge, ~~at~~ about 35 ~~miles~~ miles east of Rochester, is a large area of low flat marshy ground, some of it under cultivation, some in *Typha*, some mixed herbs esp. *Lythrum salicaria*, a large area of forest, dead on south side of road (probably from flooding), in poor shape on north side. I would judge that this area is very severely managed. It has some open water.

Aug. 31 Chimney Bluffs, Lake Ontario east ofodus Bay
Badlands eroded into bluffs of till up to 25-30 m. high, many weird pinnacles. Pioneer plants on lower slopes of raw till:

- a *Salix kali*
- c *Daucus carota*
- c *Achillea millefolium*
- lc *Fragaria* sp. (center tooth subequal ^{to} _{to})
- lc *Oenothera biennis*
- ~~*Daucus carota*~~
- la *Populus deltoides*
- c *Poa*
- n *Agrostis*

- ~ *Chrysanthemum leucanthemum* V
- c *Aster cordifolius*
- o *Geranium vulgare*
- o *Prunella vulgaris*
- ~ *Sonchus oleraceus*
- ~ *Pteridium aquilinum*
- ~ *Potentilla cf. recta*
- ~ *Plantago lanceolata*
- lc *Solidago sp.*
- lc *Euthamia graminifolia*
- ~ *Cirsium vulgare*
- ~ *Phleum pratense*
- lc *Melilotus alba*
- ~ *Cirsium arvense*
- ~ *Lychnis cornaria*
- o *Hypericum perforatum*
- l *Lactuca scariola*
- la *Equisetum arvense*
- o *Plantago major*
- ~ *P. rugelii*

Most in the gullies, where moisture, and presumably nutrients, are more abundant, than on other species. Also near the ends of this series of bluffs where they are lower, other species come in.

Sept. 1 Watkins Glen State Park
Gorge cut in flat shale and phyllite beds. Vertical cliffs, waterfalls and deep pools. Walls have many ferns and native flowering plants.

Forest above is a mixture of white pine, ash, tulip (!), hemlock, *Ostrya*, red maple, *Tilia*, yellow birch, chestnut oak, red pine, black birch, *Juglans sp.*, red oak (A), and chestnut sprouts. Proportions vary greatly. Hemlock tends to occur in groves. *Quercus alba* rare.

Aug. 31 - Orchard Beach Camp Ground,
north of ~~Lodus~~, on Lake Ontario

44303

Oxalis stricta L.

✓3

common under trees in
grassy orchard on glacial till
soil.

Aug. 31 - head of Lodus Bay,
Lake Ontario

in ~~water~~ edge of water
with abundant aquatic

✓3

04

Wolffia punctata Griseb.
abundant, floating

✓5

05

Lemna trisulca L.
abundant, submerged

Aug. 31 - Chimney Bluffs
south shore of Lake Ontario
east of Lodus Bay
on bare eroded till slopes
just above lake shore

x1

06

Lychnis coronaria (L.) Desv.
rare

x1

07

Lactuca scariola
rare

x1

08

Hypericum perforatum L.
rare

✓3

09

Salsola kali L. var. *kali*
abundant

x1

10

Plantago rugelii
rare

x1

11

Plantago major L.
rare

✓2

12

Cirsium arvense (L.) Scop.
rare

stems decumbent at base,
~~stems~~ stolons rose pink,
flowers yellow, buds
nodding; fruits erect,
pedicels not deflexed.

plants

top thallus oblong, top
flattened hemicylindric,
bottom pale, swollen.

already old and dead.

erect; ^{glades} leaves vertical,
more or less in one plane.
flowers deep yellow.

leaves fleshy.

leaves purple at base
of petiole.

flowers light purple.

- 44313 *Achillea millefolium* L.
cf. var. *lanulosa* (Nutt.)
common
- x1 14 *Aster cordifolius* L.
occasional
- x1 15 *Sonchus arvensis* L.
rare
- x1 16 *Populus deltoides*
common, colonizing
- 13 17 *Equisetum arvense*
cf. *E. pseudoalpinum*
large colonies
- ✓ 2 18 *Poa*?
common
- x1 19 *Agrostis*
rare

Sept. 1 - north of Sodus

- 12 20 *Digitaria*
abundant in cultivated field
- Sept. 1 1 mi. s. of Glenora, hills
west of Seneca Lake, Yates Co.
- 13 21 *Echinochloa*
in moist roadside ditch, common
- Sept. 1 Watkins Glen, Schuyler Co.
- x1 22 *Lobelia bahni* L.
common in wet crevices in
cuts in flat shale beds

flowers white; plant
single-stemmed (others
seen many stemmed from base)
ray flowers lavender, disk pale
yellow.
erect, flowers bright yellow.

shrub 1.5 m. tall;
petioles somewhat
flattened, red.
branchlets strongly
ascending to erect.

Tufts, culms decumbent
at base, ascending.

culms decumbent at base,
ascending; racemes blackish-purple.

culms ascending to erect, leaf
sheaths forming a flat mass
at base.

flowers blue and white.

1963 Virginia

Sept. 19 - Balls Bluff
n. of Leesburg

Bottomland forest -
 Platanus, Quercus prinus
 Ulmus sp. Juglans nigra,
 Celtis, Asimina (to 6-7 m.)
 Lindera (to 4 m.), Acer negundo
 Pawpaws ~~are~~ full-sized
 but not ripe yet.

la Rapanea
 lc Urtica
 l Pilea
 lc Boehmeria
 a Glehnia

On slopes in forest
 Collinsonia
 Ledum

154

1943 Virginia

Sept. 15 Ball's Bluff, Potomac
River n.e. of Leesburg
in bottomland forest

#

44323

Quercus prinus

occasional

✓ 1

✓ 2

24

Hibiscus militaris CAV.

occasional along river

✓ 2

25

Laportea canadensis

abundant locally

~~26~~

on bank of river

x 1

26

Eclipta prostrata (L.) L.

occasional

x 1

27

Artemisia annua L.

common

on eroded Triassic shale
or sandstone terraces in
sparse second-growth
hardwood forest

✓ 2

28

(Rabrt.) Perilla frutescens (L.) Britt.

locally abundant

x 1

29

Prunella vulgaris v. *canadensis*

occasional

✓ 2

30

Lespedeza procumbens

common

~~31~~

x 1

31

Spiranthes tuberosa Raf.

rare

Loudoun Co.

155

CONNECTICUT STATE BOARD OF FISHERIES AND GAME

BARN ISLAND SHOOTING AREA

The survey of coastal wetlands made by the Department and the U. S. Fish and Wildlife Service in 1954 shows a continuous marsh area around Barn Island of about 370 acres. Of this acreage about 75 acres is described as shallow fresh marsh, 250 acres as salt meadow and 45 acres as regularly flooded salt meadow. A considerable part of this marsh acreage is included in the 557 acres of State-owned marsh and upland known as the Barn Island Shooting Area.

Departmental purchases in this area began in 1944; none have been made in the past ten years.

From 1945 to 1947, four dikes, totaling somewhat more than 2,000 feet, which impounded a maximum of about 135 acres, were built. In 1955, a ditch about 12 feet wide, 4 feet deep, and 600 feet long was dug across the neck of marsh connecting Barn Island with the mainland. At the same time, two semi-circular pools about 400 feet by 120 feet were dug in the marsh area in front of the Brucker property, with the spoil deposited in piles adjacent to the pools. Some other rather minor development work of an experimental nature has been done on both the marshes and the upland. An access, parking, and boat launching area, that has since been enlarged, was established at the present site in 1957.

From 1947 through 1950, the Department sponsored a variety of investigations on the area by graduate students and others. One publication, Vegetation of the Wequetequock-Pawcatuck Tidal Marshes, Connecticut - Miller and Egler - Ecological Monographs, 20: 143 - 172, April 1950, resulted from these investigations.

The Barn Island area, historically, was an exceptionally good waterfowl and shore bird hunting area. For a number of years it was leased to a group of sportsmen for this purpose. These marshes were mosquito ditched in 1929 - 1932. Following the ditching, the sportsmen's group are reported to have reduced their lease offer and then cancelled the lease due to the absence of birds.

The impoundments have provided excellent waterfowl production, and feeding and resting area for birds in spring migration. They also make the area attractive to fall migrants, but their use during the open season is sharply reduced by hunting. Management work here is presently at a minimum.

Some added acquisition is necessary to round out the area, insure the rather limited supply of fresh water, and furnish buffer for existing and planned impoundments. Such purchase might give impetus to further development and more intensive management.

JSB/B
8/20/63

Sept. 15 Ball's Bluff, Potomac
River n.e. of Leesburg
in bottomland forest

- # 44323 *Quercus prinus*
occasional
✓ 1
✓ 2 24 *Hibiscus militaris* CAV.
occasional along river
✓ 2 25 *Laportea canadensis*
abundant locally

~~26~~

on bank of river

- ✓ 1 26 *Eclipta prostrata* (L.) L.
occasional
✓ 1 27 *Artemisia annua* L.
common

on eroded Triassic shale
a sandstone terrace in
sparse second-growth
hardwood forest

- ✓ 2 28 (Pabst) *Perilla frutescens* (L.) Britt.
locally abundant

- ✓ 1 29 *Prunella vulgaris* v. *canadensis*
occasional

- ✓ 2 30 *Lespedeza procumbens*
common

- ✓ 1 31 *Spiranthes tuberosa* Raf.
rare

70 m

twigs cut (by squirrels?)
from a tree 30 m tall, leaves
glaucous beneath.
shrub 1-1.5 m. tall,
~~the~~ stinging herb up to
0.8 dm. tall, fruits
swollen, fleshy,
translucent pale green.

prostrate, rays white.

herbage fragrant

90 m

~~leaves~~ stems dark red,
leaves reddish beneath,
flowers pink.
lips of corolla violet

stems procumbent,
flowers pink, standards
red in center.
erect, flowers white,
conspicuous, spirally
arranged.

Sept. 22 - just south of Markham
Dianthus?

44372
✓ 5

common in grassy orchard
on rocky hill

Sept. 22 - 1 mi. south of Markham
in poor second-growth
deciduous woods on
rocky hill

✓ 2

33

Hedyotis ~~longifolia~~ purpurea var.
occasional on slope

only made

✓ 81

34

Galium latifolium Michx.
common in shade

35

✓ 4

35

Woodsia obtusa (Spreng.) Torr.
common in rocky bottom of
broad ravine

✓ 2

36

Asplenium platyneuron
very common in bottom of
broad ravine

✓ 2

37

Hedeoma pulegioides
local in rocky bottom
of broad ravine

X 1

38a

Ulmus rubra
common

flowers deep lavender

loosely caespitose,
procumbent; roots
deep yellow, turning red.
fronds turning yellow

very aromatic

slender tree 6 m. tall.

Sept. 28 - Stony Point,
Albemarle Co

Pasture being invaded
by *Juniperus virginiana* (photo)
This is rolling land,
with fairly high hills
to the east a mile or so.

Mostly pasture with
patches of woods,
scraps of old orchard,
hedgerows and thickets.
Patches of *Pinus virginiana*
here and there.

Fall coloring just begin-
ning to appear.

Fernbrook Woods -

Along road - tulip,
red maple, spanish oak,
Cormus over bluff
mixed low juniper,
Pinus virg., *Sassafras*,
etc. Fringe of large
black oaks at top of bluff
undergrowth of *Carpinus*
2-4 m. tall, some *Celtis*.

Much hickory at first,
in oaks, but none farther down.
Below is north fork of Rivanna R.
~~Thal~~ *Malva* on bluff.

Asarum virginianum
Small patch of *Taxus*
at top of cliff.

7 good plain with *Acer*
negundo, *Celtis*, *Juglans*
Carya, *Platanus* (s.)

Much *Pinus echinata*
some *P. virg.* on ridges.

Across ravine scattered
white pine, largest
10' 1" girth b.b.

Much *P. strobus* reproduction
in forest - saplings
to 5 m. tall.

Quercus falcata
mixed with *P. echinata*
+ *P. strobus*,
understory of *Cornus florida*.

Large old beech wolf tree
at lower left corner.

Chimaphila mac.
generally abundant.

On main broad ridge
mostly oak above
middle.

Tulip on lower ground
toward lake.

1943 Virginia

Sept. 29 - Milam's Gap
Meadow with scattered
Pinus pungens. *P. virginiana*
abundant aster cond.
Aster ericoides (L.)

Scattered *Pyrus malus*,
Crataegus.

Both *Crataegus* & *Pyrus*
attached by *constrictum*.
Sclerophylls abundant,
about 4 spp.

Evidence of slight
frost.

Rubus sp. *flagellans*
forms large patches.

Rhus, *Acer rubrum*,
Fraxinus well turned to
autumn color. *Rubus* &
Vaccinium also.
Parthenocissus also

Tanner Ridge Overlook
3465'

Meadow almost covered
with *Corylus*, *Vaccinium*,
Robinia scattered pine.
(photos)

nos. checked
162

labels typed
XX

1963 Virginia

Sept. 29 - Skyline Drive,
Tanner Ridge Overlook
Solidago altissima L.
common in meadow

✓

Sept. 29 Tanner Ridge
in ^{open} second growth woods

✓ 3 39 Epimaea triloba L. det. v.d. Werff
common

✓ 2 40 Corylus cornuta Marsh.
abundant as undergrowth

✓ 1 41 Oxalis corniculata var
common along trail

✓ 1 42 Botrychium dissectum f. oeroidense (Gillb.) Chitt.
rare

✓ 2 43 Aster azureus Lindl.
locally common

✓

Sept. 29 Appalachian Trail
bet. Milam's Gap and Tanner Ridge
in thick second-growth woods on

✓ 2 44 Aster cordifolius var. racemiflorus Fern.
common, locally abundant

✓ 2 45 Physalis ~~heterophylla~~ ^{heterophylla} var. nyctaginea
(Dunal) Fern.
rare in semi-open place

✓

same in semi-open ~~open~~
second-growth thickets

✓ 4 46 Polygonum cristatum Engelm. Gray
very local in

3 47 Alnus serulata
~~local~~
same - in dense ^{second growth} woods

✓ 3 48 Alnus serulata

Shenandoah National Park 163

1075 m

several stems in ^{loose} clump,
erect; flowers yellow.

50
1025 m

rays lavender, disk
turning dark red.
shrub 2 m. tall.

erect.

frond green

rays pale lavender,
disk yellow turning red.

1000 m

west slope

ray flowers lavender, disk
pale yellow, turning ~~light~~ red.
several stems spreading
from base.

twining over weeds

several stems from base
about 5-6 m. tall

Pilea pumila

✓3

common very locally

X1

49

Asplenium platyneuron (L.) Oakes
very common, ~~in~~ more
so in openings and
meadows, this at
edge of thicket

✓

same - in openings between
thickets on gentle slope

X2

50

Solidago canadensis
locally common

X2

51

Aster pilosus var. *dematus* Blake
locally common

✓

Sept. 29 Milams Gap
in weedy meadow
with scattered trees
and patches of shrubs

X2

52

Botrychium multifidum
occasional

X2

53

Crataegus succulentus v. *neoflorialis*
(Ashe) Palmer
common

X2

54

Solidago arguta Ait.
very common

✓2

55

Lycopodium complanatum
locally abundant

X5

56

Solidago nemoralis Ait.
very common

X2

57

Aster cordifolius var. *cordifolius*
very common or abundant

stems fleshy, translucent

erect, flowers yellow.

rays white, disk dull
yellow turning dull reddish.~~segment~~ leathery, beginning
to turn purplish.~~small~~ bushy dense tree-like
shrub, 3 m. tall, fruit bright
red, soft mostly attached by pumpe.
stems red; heads past
flowering.~~stem~~ ^{rhizome} prostrate, on or in
surface of ground; leaves
tending to be glaucous
(resembles *L. thymifolium* but
for superficial rhizomes).
cinereous, fls. yellow.

rays lavender, disk reddish.

Cirsium discolor (Muhl.) Spreng.
occasional

Sept. 29 - Hazletop Ridge
Overlook, Skyline Drive

in edge of deciduous forest

X2 59 *Aster lowricanus* Pater
common

X1 60 *Aster cordifolius* v. *racemiflorus* Fern.
occasional

X1 61

X1 62 *Cladonia*

X1 63 *Cladonia*

X1 64 *Uvae*

X1 65 *Umbilicaria*

X1 66 *Parmelia*

X1 67 *Parmelia*

on large sloping rock at edge of

X2 68 *Solidago petiolaris* Ait. var?
occasional

X4 69 *Solidago petiolaris* Ait.
abundant

same - ~~roadside~~ weedy areas

X4 70 (grass)

rare in parking overlook

X3 71 *Aster pilosus* v. *pilosus*

rare in parking overlook

X3 72 *Aster pilosus* var. *dennatus* Blake

on embankment below road

X4 73 *Aster simplex* var. *ramosissimus* (T. & G.) Cronq.?

common at edge of parking overlook

X3 74 *Aster cordifolius*

common on embankment

flowers bright purple

3265'

995m

rays lavender, disk pale
yellow, turning red.

— rays lavender, disk pale
yellow, turning reddish.

flowers yellow
(thyse very short and compact)

flowers yellow
(thyse elongate, loose)

branched at base, loose
clump, stems weak.

— rays white, disk yellow,
turning reddish.

— rays white, disk yellow,
turning reddish.

— erect, rays very pale
lavender, disk yellow, turning reddish
— rays pinkish lavender, wide
disk reddish.

nos. checked

168

Labels typed HK

1963 Virginia

- 44375 Aster cordifolius L.
✓ 2 common on embankment
✓ 2 76 Aster cordifolius L.
common on embankment
✓ 1 77 Rudbeckia laciniata var. humilis Gray?
rare on weedy embankment
✓ 6 78 Solidago flexicaulis L.
common on weedy embankment
✓ 3 79 Aster simplex var. ramosissimus
common on weedy embankment (7+9.5) long.

Shenandoah National Park 169

- rays very narrow
lavender, disk reddish.
— rays medium width.
lavender, disk reddish.
— rays pale yellow, disk
dull dark greenish, live.
flowers yellow.
— rays very pale lavender,
disk ^{pale} yellow, turning reddish.

not checked
170
Labels typed

1963 Virginia

Sept. 28 - Stony Point
in ^{mixed} second-growth woods

44380 *Viburnum acerifolium*?

common

✓ 1 81 *Gleditsia triacanthos*
rare

Oct. 5 - Belvedere Farm,
Rappahannock River below
Fredericksburg

✓ 1 82 *Epipagus virginianus*
under beech tree in
wooded ravine

Oct. 20 - same

on flood-plain

3 83 ~~Verbena~~ *Actinomeris alternifolia*
abundant, especially
in grazed open forest

3 84 *Cyperus*
in open desiccating
margin of slough.

1 85 *Hypericum*
on stump in edge of slough

2 86 *Cuscuta*
parasitic on *Boehmeria cylindrica*

1 87 *Viola*
rare in pasture

5 88 *Lemna* cf. *minor* L.
common in scum of
Lemna and *Wolffia* in desiccating

5 89 *Wolffia columbiana* Karst.
very abundant, forming scum
on water of desiccating slough.

Albemarle Co. -

171

Spottsylvania Co.

shrub 1.5 m. tall, sterile.

dying old snag, no thorns.

stem bronze purplish.

Spottsylvania Co.

erect, to 2 m. tall; flowers
bright orange-yellow.

culms closely
appressed to ground.

flowers and fruits white.

flowers violet, claw of
lower petal white with dark
lines.

thalli green above, deep
purple beneath.

~~Oct. 5~~ Belvedere Farm

Large tract of second growth - mostly mixed oak forest - in low spots pin oak - sweet gum, on higher level growing largely white oak, occ. scarlet willow oak, on ~~the~~ low rolling hills more mixed oak, with scattered small junipers and more and more scrub pine. An old civil war embankment pine is dominant, a few P. rigida and P. echinata these up to 20 cm. dbh. close together, some dying no new sturdy seeds scattered small junipers spanish oaks.

On slopes a good erucaceous shrub layer. Good Ilex opaca layer in oak forest not so much in pines.

A Myrica at least 8 m. tall. Carpets of Mitchells ~~seems~~.

Considerable Carya mixed with oaks on flat ground.

Q. alba, occidentalis, stellata phellos, etc. largest up to 2' + dbh.

Ravine on lower end of farm has abundant Rhododendron maximum, very large trees - tulip, several oaks, Fagus, Carpinus. Trees 30-35 m. tall.

Ravine is about 25-30 m. deep. canopy very thick. Lowing stream, even in this very dry season.

Asarum virginicum
Collinsia canadensis
Lindera benzoin

On peninsula in meander of river - Platanus, Acer negundo, G. palustis.

A large pond filled with dead snags covered by Ferns and Wolffia.

Many ducks, a blue heron, many doves.

A flock of seven of vultures - black and turkey, roosting in trees right near farm house.

Pileated woodpecker.

Flicker a large hawk - red-tailed?

The peninsula is flood-plain, heavily pastured.

Oct. 12 - Falls Church

Aster macrophyllus
has spread and is
flowering very abundantly
in sweet-gum forest from
stock planted a few
years ago.

Oct. 20 - Primer William
Forest Park - Fall

coloring about at its
best - *Acer rubrum* and
Nyssa sylvatica very
bright red, *Liriodendron*
and *Carya* rich yellow.
Oaks not at their brightest
yet, but some rather
good. *Cornus florida*
rich red. Coloring
less bright in ravines.

Oct 20 Belvedere Farm

Birds Turkey Vultures
Chickadee
Flicker
Bluebird?
Nuthatch
Woodpecker (pileated)? (heard only)
Woodpecker (smaller)
Crow
Black vultures
Blue jay?
Great Blue Heron
Wood Duck?

Trees on floodplain

c *Juglans nigra*
c *Salix nigra*
a *Platanus occidentalis*
o *T. radicans* sp.
a *Acer negundo*
c *Betula nigra*
o *Celtis occidentalis*
o *Populus deltoides*
o *Ulmus americana*
o *Liquidambar virginiana*
c *Liquidambar virginiana*
~ *Quercus palustris*
~ *Morus rubra*
l *Liquidambar styraciflua*
~ *Fraxinus* sp.
~ *Ilex opaca*
l *Alnus serrulata*
la *Juniperus virginiana*
~ *Prunus serotina*
lc *Robinia*

Raccoon tracks

muskrat gnawing

beaver lodge & dam

fallen *Populus* 32 paces tall, 1 m dbh.

On steep slope is
forest of *Juglans*, *Quercus* sp.
Liquidambar, *Liriodendron*

Flowing spring emerges
at bottom of this slope about
50 m from beaver dam.

- 44390 Cyperus
3 on desiccating margin of
slough
- 3 92 Ludwigia decurrens
on beaver dam and
in mud beside it
- 1 93 Cyperus ^(Hyllingia) tenuifolius (Steud.) Dandy
very rare on desiccating
margin of slough
- 1 94 Panicum
occasional on desiccating
margin of slough
- 2 95 Polygonum punctatum
rare on desiccating
margin of slough
- 96 Gratiola
on desiccating margin
of slough
- 2 97 Bidens
on desiccating margin of slough
- 1 98 Leersia
occasional on desiccating
margin of slough
- 1 99 Polygonum
occasional on desiccating
margin of slough
- 44400 Echinochloa
2 rare on desiccating margin
of slough.
- 2 01 Cleocharis
occasional on desiccating
margin of slough
- 2 02 Saururus cernuus
abundant on desiccating
margins of slough

herb up to 1 m. tall,
petals yellow, tending
to be rhombic, falling easily.
heads pale green.

culms spreading, prostrate.

stem ascending,
flowers white.

prostrate; corolla pale
lavender.

flowers yellow

culms spreading.

stems reddish, ascending;
flowers pinkish.

culms spreading

tufted

stems to 1 m. tall,
swollen at base.

- 44403 *Callitriche*
 on desiccating margin of slough.
 04 *Ludwigia*
 abundant on desiccating
 margin of slough
 05 *Polygonum*
 rare on desiccating
 margin of slough
 06 *Bidens*
 rare, on log in ~~slough~~ margin
 of slough.
 07 *Polygonum*
 occasional on desiccating
 margin of slough
 08 *Eclipta*
 on desiccating margin
 of slough and on logs
 09 *Polygonum*
 on desiccating margin of slough
 10 *Fratiola*
 rare on desiccating margin
 of slough
 11 *Polygonum pennsylvanicum*
 rare on desiccating margin
 of slough
 12 *Bidens*
 common on desiccating
 margin of slough
 13 *Cyperus*
 common on desiccating
 margin of slough
 14 *Polygonum*
 occasional on desiccating
 margin of slough

prostrate, forming a close mat.

prostrate leaves
purple.

flowers white.

stems ascending, flowers
pink.

flowers white.

flowers pinkish

prostrate, flowers
pale lavender, corolla
falling very easily.
flowers pale pink.

stems ascending;
flowers pink.

Oct. 26 - headw. of Powhatan Cr.
Swamp of *Acer rubrum*,
Quercus prinus
Liquidambar

with
Caltha palustris
Aster lateriflorus
Asmunda regalis
Lymnophora
Impatiens
~~*Quercus prinus*~~
Bidens sp.
Lacuna cernuus
Solidago
Oxycoccus

Chrysanthemum
Cineraria
Decumana
Rhus vernix
Ulmus alata
Asimina
Smilax rotundifolia
Trillium pauciflorum virginicum
Vaccinium corymbosum
Smilax bona-nox
Magnolia virginiana
Ilex opaca

Botrychium dissectum
Rudbeckia lacineata
Woodwardia virginica
Medeola
Lilium
Cinna arundinacea

same - slope above ~~the~~
swamp

Quercus alba
Fagus
Pinus taeda
Quercus prinus

Mitchella
Pteridium
Vaccinium vacillans
Polystichum
Asplenium platyneuron

Swamp on east side
that has been logged
recently

Lobelia cardinalis
Caltha palustris
Hypericum mutilum
Aster lateriflorus
Jussiaea
Penthorum
Ilex laevigata
Cinna
Viburnum cf.
Campsis radicans
Gratiola
Orontium
(scrub)

This has been logged
so no significant
sized trees are left.

Oct. 26 - Powhatan Creek
lower down

Logged out cypress
swamp.

Old cypress stump 1 m dbh.
Acer rubrum cut out, too.

Caltha palustris
Saururus cernuus
Pilea pumila
Lycopodium
Peltandra virginica
Bartonia
(scroph.)
Impatiens
Erechtites hieracifolia
Ithyrion filis-fermings

One cypress seedling and
a few sprouts seen.

Oct. 27 - Woods back of Providence
Hall, Williamsburg

Mixed deciduous
woods. Tulip (one tree almost
4' dbh) *Quercus alba*, beech,
Platanus,

various trees bet. 3 & 4 ft.

a deep ravine with
tulip + white oak. *Q. palustris*,
about 5-8 m deep.

extends along between
golf course and Rockefeller
property.

Understory of young beech,
Asimina, *Cornus florida*.

A few pines - a very
large *P. virginiana*
a few *P. taeda*.

Thelypteris hexagonoptera
Polystichum acrostichoides

Ground mostly over-
grown with *Lonicera* sp.

Several *Q. velutina* but
with curiously whitish
platy bark. Inner bark yellow.
One or more large *Q. coccinea*.

a few small *Pinus virginiana*
seedlings in woods. Below
a very small opening
in canopy in lower part
on east bank.

No *Lonicera* in this area.
which is mostly Rockefeller prop.

Kingsmill Tract } Rockefeller
Stewartia } prop.
"Jamestown Lily" }

Labels typed
186
by HK

1963 Virginia

Oct. 26 Powhatan Swamp

recently logged swamp
with *Taxodium* and *Acer rubrum*

44415

X 5

Ilex verticillata (L.) GRAY

occasional

X 1

16

Itea virginica L.

rare

X 1

17

Athyrium filix-femina (L.) ROTH

common on slightly higher ground

X 1

18

Cuscuta compacta Juss.

parasitic on *Smilax*
and *Lindera*

X 1

19

Callicarpa americana L.

X 1

20

Bartonia virginica

rare, on moss cushions

Oct. 26 - North Branch,
headwaters of Powhatan Creek

in deciduous swamp

X 1

21

Smilax hispida

det. D. Speer

occasional

X 5

22

Botrychium dissectum v. *obliquum*

occasional

X 3

23

(umbell) *Cicuta bulbifera* L.

common

X 2

24

(comp.)

rare

X 1

25

Solidago

rare

X 1

26

(comp.)

rare

James City County

187

shrub, fruit scarlet,

fleshy.

shrub

fronds erect.

inflorescences swollen,
flowers white.

shrub, fruits bright

purple.

flowers whitish.

sterile

leaf somewhat purplish.

flowers white; fruit immature.

flowers yellow.

involucre almost black,
disk almost black, rays yellow.

- 44427 *Chrysopsis graminifolia*
 rare on slightly higher ground
 X1 28 *Ilex verticillata* var. *cyclophylla*
 locally common
 X1 29 *Botrychium dissectum* f. *dissectum*
 rare
 X1 30 *Ranunculus pusciius* Poir.
 rare in mud
 X2 31 (scroph.)
 common very locally in mud

flowers yellow.

Robins shrub 15m. tall; fruit
 scarlet, fleshy.
 leaves slightly purplish.

petals yellow, minute.

plant depressed;
 flower white, throat yellow.

Oct. 27 - flight around
Williamsburg - Cypress
swamp, Chickahominy R.
Jamestown - Kingsmill area -

striking picture of
yellow tulip trees mixed
with green pine and
reddish maples and oaks.
Marshy creek with
meandering channel west
of airport toward Camp Peary.
About 90% of area is still
wooded.

Marshy creeks

Angular patches of pine
repr. old clearing.
Stream courses outlined
by bare trees. These have
barred streams.

Large areas of marsh
on Chickahominy R.

Cypress swamp on small
stream - photo
Area bet this & James R.
mostly oak, maple, pine,
few tulip.

Lower reaches of most or
all streams lined by
marsh, upper by bare trees.
photos.

Rochelle Woods
Partly pine, partly
mixed.

Reservoir has bare
shores.

College Woods -
Primarily deciduous -
some Pinus taeda
Prob. logged in 1920's.

Fagus
Q. prinus
Pinus taeda
Q. alba
Liriodendron
Q. falcata
Q. stellata
Acer rubrum
Q. velutina
P. virginiana
Carya sp.
P. echinata
Understory
Cornus florida
Myrica
Spiraea spinosa
Ilex opaca
Castanea pumila
Ostrya
Kalmia latifolia

Erigeron pulchellus
Osmunda cinnamomea
Epipagus
Galax
Asarum virginianum
Asarum canadense
Cypripedium acaule
C. calceolus
Epigaea

Shrub layer
Viburnum acerifolium
Gaylussacia baccata
 (continuous layer)
~~*Chimaphila*~~
Vacc. corymbosum
Viburnum nudum
Rhus copallina

Mitchella
Medeola
Woodwardia virginica
Chimaphila mas.
Solidago bicolor
S. odorata
Sphagnum

Pileated woodpecker

Nov. 10 Wildcat Mt.

west side

Slope viewed from road
(photos) most trees are
still colored - probably
mostly oaks. (first photos
from old house, next from
next high hill.)

Mainly range from green
to yellow through range
& oaks. 3 more photos from base
of hills - Platanus in p.g.

Red tailed hawk.

Great Horned Owl
(heard)

Woodchuck (skull)

Meadow at base of slope

*Solidago altissima**Rubus argutus**Agrimonia gryposepala**Panicum clandestinum**Lonicera japonica**Rosa carolina**Cirsium cf. discolor**Eragrostis spectabilis**Tridens**Phleum pratense*

Edge of wood

*Viburnum nudiflorum**Epilobium* sp. (large) in ravine*Quercus alba* (common tree)*Lunifera virginiana**Platanus occidentalis*

abundant in lower ravine

*Phytolacca americana**Ailanthus altissima**Lonicera japonica**Quercus palustris**Smilax rotundifolia**S. hispida*

Lower slope forest.

*Lonicera japonica**Quercus alba**Ostrya virginiana**Kalmia latifolia*

Outcrop of large rocks

Hammamelis virgin.
(flowering)*Quercus rubra*?*Q. coccinea**Q. prinus**Pinus rigida*?*P. virginiana**Lunifera virginiana**Quercus velutina*?*Polypodium vulgare**Vaccinium vacillans**Ceanothus**Cunila
rigandoides*

Nov. 10 - Wildcat Mountain
Preserve, west base of mountain
in edge of woods

44432 *Ailanthus altissima*

X1 occasional

X3 33 *Smilax hispida*

common

X1 34 *Elephantopus carolinianus*

occasional

X2 35 *Muhlenbergia schreberi*

common

X2 36 *Epilobium glandulosum* Lehm.

common in bottom of
small ravine.

X2 37 *Solidago*

occasional

X1 38 *Rubus occidentalis*

common

same - in meadow

X1 39 *Hypericum mutilum* L.

occasional

same - on lower rocky
slopes in woods.

X3 40 *Hammamelis virginiana*

common

X3 41 *Ostrya virginiana* (Mill.) K. Koch

common

X1 42 *Hepatica americana*

occasional

X1 43 *Galium circaezans*

occasional

X1 44 *Hystrix patula*

locally common

small tree, leaflets
at this season.

stems green; leaves
falling; fruit blue-black.
plant dried up.

decumbent.

dry except sprouts at
base.

leaves turning reddish
above.

canes arching, very
glaucous.

shrub 3 m. tall,
flowers bright yellow.

small tree about
7-8 m. tall, leafless.
leaves purplish

198

1963

Virginia

44445

Anemone virginiana

X1

common in this area

X3

46

Solidago caesia L.

common

X1

47

Aster

occasional

199

leaves purple.

1

200

44

✓1

X3

X1

✓