RECORD

Washington 25, D. C., U.S.A.

Collection and Field Note Book

No. 79

(May 10, 1966 - Aug. 2, 1966)

(47772 - 48013)

Book # 79
begin # 47772
end # 48013

Pacific Vegetation Project
c/o National Research Council
2101 Constitution Ave., N.W.
Washington 25, D. C., U.S.A.

R

1966 Canal Zone

May 10 - Navy Pipe Line Rd.

Typical Tangled second growth, with Cecropia, + other secondary species.
Improving gradually along road. The pipe-line right-of-way is in grass. Woody things removed by cutting.

Stream bed - Hunting Camp

Araceae

Homalomena crinipes

Leaf blade: 70 X 33 cm; anterior lobe 45 cm long; posterior lobe 27 cm long; peltate for 2.5 cm. Petiole not geniculate, with up-curved prickles, 1 m. long; sheath persistent, 15 cm long. tan primary veins & midrib white

BCI 70°-72° — 80°-89°

annual prec. 80-90"
3-4 mo. Jan.-April < 10"
Oct - Dec. (1st w.) rainiest season.

Geophila repens
BCI. Shallock 130 Harry 286

Herb. BCI
8 steel cases, upright, single width, 26 pigeon holes. each pigeon hole 1/10 - 1/4 full.

Forest is old secondary with some fairly large trees.

Columbus ~~Isla~~ Isleta better invite to sea level Canal Conf.

Local spots in forest ~~a~~ where ground is wet and a constant drip ~~gas~~ comes down. Produced by a spittle insect that occurs in masses

1966 Panama

May 11 - Trip by car from Balboa to El Valle

First several miles secondary semideciduous forest, well developed. Immediately across the boundary in the republic, there is really very poor vegetation. From here on more and more savanna-like in character till it becomes a typical Curatella - Byrsonima savanna.

4 photos Kod. x 4 x 20 across El Valle. showing semi-denuded hills.

Cerro Campana is an older volcano just east of El Valle.

Rio Hato

both rock and sand shores. tide 16-20'.

Coastal lowlands are relatively flat, a few feet above s.l., but dissected by sharp steep-sided ravines. The material is an irregular friable tuff, quite weathered. Vegetation an irregular tangled tall scrub with taller thickets. Byrsonima & Curatella very common. In places open, even open enough to be called savanna.

2-3 mi. e. of Bajuco Chame Bay. Large mangrove swamps extending ~~out~~ in several miles. This coast has a very great tidal range, and around the edge of the swamp is a strip of vegetation-free sand.

1966 Canal Zone

Labels typed

May 10 - Navy Pipe Line Reserve, about 1 mi. from entrance along road.

47772 Helicteres
x2 common in weedy scrub — shrub 2 m. tall, flowers red.

May 10 - Barro Colorado Island

x1 73 Eleusine indica (L.) Gaertn. — firmly rooted tufts (said by Mr. Chadwick to be a great pest)
in paths around station

x3 74 Olyra — tufted, erect or ascending.
in path in dense old second-growth forest

May 12 - Fort Clayton
(discussion)
Research Div. (one of 5 divs.)
(part of Test and evaluation command
part of Army Material command)
Alpert does not give direct orders but has much influence on what is done.

Res. Div. authorized str. 18 people
now only 12.
activities
1 coll + anal. of data on trop. env.
2 developing of testing methodology
3 actual testing

Psych.
attenuation of sound
" " visibility
anthropometry

Data base project:
Veg.
Microbiology
Macrofauna

5 sites - at Ft. Clayton (existing)
2 at Ft. Sherman (proposed)
1 at Rio Hato (proposed)

Allbrook site - forest
Chivachova site - cleared

Data base inf. unclassified and available.

No program for training of helps.
Contractor furnishes technicians. not always any good.

Local areas of saccharum spontaneum in openings near old hospital bldg.

Allbrook Tower -
construction of piping (2")
2 m.t. platforms + 45° ladders.

The forest here has a rather incomplete and irregular canopy. Base of canopy is 15.5 m officially

site is 100' above sea level.

Semi-deciduous forest. loose but more less continuous 2-4 m shrub layer

About 30-40 m from tower is an opening a few m across.

Geophila repens
Ft Sherman Tyson + Blum 1658
old Ft San Lorenzo Tyson 2207

Herbarium has metal pipe racks, room about 15 x 40' air cond.

Dryer with good capacity, plenty of heat, but poor ventilation.

No genus covers yet.

No herbarium cases yet.

Kurt E. Blum and Ed Tyson have collected several thousand nos. sent to Dwyer + many are det. + mounted with plastic. Still some unlabelled and many unident. + unmounted.

Smithsonian Marine Biology Lab. Naias I.

Two buildings and a small pier. Circulating sea-water system.

A little work has been done on physical oceanography by Interam. Trop. Tuna Comm.

Facilities are best for keeping live animals under observation. One controlled temp. unit.

One building has huge tanks, some in good shape. huge crane to move things.

1966 Panama

Small Island near Smithsonian lab & Nike site.

Covered by a tangled scrub of Bursera, Hylocereus, various shrubs & vines with scattered trees
Hippomane mancinella
Bursera simaruba
Ficus
Chrysobalanus icaco
Tecoma stans
Cecropia sp.
Sapium

May 14 – Flight Panama (Tucuman) to San Jose, C.R. dep. 7:25 a.m. (left side, Viscount) arr. 8 a.m.

OTS has 8 vehicles, need 12. Trying to get tax exemption.

General course 20 people
(& 18 sections this term)
2 adv. courses (Zool. & Bot.) 10 p. each.
(one bot. only this year)
different each year.

Interested in 3 types of research funds 1. Program research
2. Independent "
3 graduate "

Proposals in for these.

Now want to expand course work & geographically.

Advanced courses should follow logically from fundamentals courses.
Admitted on competitive basis.

Coop with Fmi.
(sugg. Preston)
1 fertile area of recruitment of junior personnel
& give staff opportunities to work with highly qualified grad. students.

Advanced courses might readily be taught elsewhere.
On systematic groups
On ecosystems.

Credits good in all universities of Consortium for graduate credit. For Michigan & Georgia as residence credit.

1966 Costa Rica

May 15 - flight in small plane from San Jose to Osa air strip. 6:10 a.m. (Casara 180) Weather generally cloudy with rain showers, except to s.w. Coffee & banana plantations around S.J. Open grassland on hills and in valleys along coast, with patches of pon woods, and thinly wooded ravines. Small orchards & coffee at foot of mt. Mts mostly grassy, with hedgerows, small coffee & banana plantations, small crop fields, wooded ravines, scattered houses. Cult. on very steep slopes, considerable erosion. Southward less houses & cultivation, more scattered trees but no real forest. Small patches of sugar cane. Farther on some forest in deep canyons. Fair sized river cutting through mts. Some small farms, more grazing than cultivation. Landscape generally grass-green. More and more patches of forest.

Ocean in middle distance out. Coastal plain fairly wide, broken by range of low hills.

On mt. following down coast, mts. had large areas of "Premontane tropical wet" forest. Canopy loose, of rounded crowns,

coastal plain mostly cleared, no large plantations, much grass.

Mts. continuously forested, scattered white trees, an occasional yellow-fld. one. Lower reaches partly cleared, some patches of forest remaining on lowlands, esp. back of small peninsula in low hills. In lowlands small banana plantations, large oil palm plantations. More land being planted to both, large area. Small streams being channelized in this flat land. Rivers meandering across plain to sea.

Long straight to somewhat curved beach with streams and lagoons parallel to coast behind this. The streams meandering, black water. Coastal areas rapidly being cleared, back to lower slopes of mts.

Some swamp along meandering streams back of beach. Tall gray-green somewhat spaced trees.

Coastal plain pinches out and mts. come to coast. A large muddy river breaks through from a sizeable valley system near end of coastal plain.

Coast now alternately sandy & rocky. Mts. still partly

1966 Costa Rica

forested, but being cleared rapidly. Coast very cuspate, bodies pointing to s.e.
Small area of flat or rolling land in places along coast back of a very conspicuous sandy cusp, 2 small streams, a tiny village on e. side of cusp at mouth of one stream.
Several tiny rocks and islets.
Mts. less and less dissected to eastward, but still some small patches of clearing.
Many barrios.
Appr. Osa Peninsula. Large estuarine lagoon at base, smaller along coast in a large mangrove swamp area. Mangrove with tall narrow crown. Black-water ponds, large areas of Acrostichum, which also forms ground layer in mangrove. Intricate system of channels. Areas of very small, dense mangrove. Channels very muddy. Mangrove very extensive. Mosaic of age classes. This mangrove area is several miles wide. Does not obviously vary to fresh-water swamp. In considerable areas mangrove forest is open, with substratum either of small mangroves or Acrostichum.

Forest in interior of peninsula or hills is scarcely touched, except some small clearing just back of mangroves.
Forest appears quite mixed and rich, canopy varies from loose to closed, small palms abundant in understory.
On Golfo Dulce side are abundant clearings just above coast before Osa P.F. Camp.
Swamps beyond camp.
Forest immediately around air strip somewhat disturbed.
Arrived on strip 7:05.
PSC bldg. at edge of forest at end of strip.

Tree ferns at very low alts.

Photos taken from panorama from air strip
Tropical wet 100 m ±

Varegas site — very flat.
Enormous canopy.
Chrysophilla in undergrowth, small trunks with masses of spiny roots, looks much like Carludovica palmata but more divisions.
Aspidosperma myristicifolium with deeply fluted trunks.
Area predominantly small pole-like vegs.
but scattered very large vegs.

largest are Carapa
shrub layer 2-3 m. -
conspicuous but not
difficult to penetrate
Open ground layer.
Cyclanthaceae in shrub
layer. many seedling
of trees - Hamalomeria. & Geonoyme (palm)
Palms abundant in
under story, usually fan
palms. Chamaephilis to 10 m.
Most trees well-buttressed
Lecythis trees may be
only a few m apart.
Almost no ferns on ground
a few on bases of trees, mostly
Lindsaya. lilis.
Spondias mombin -
large forest tree.
Xylosma has branched
thorns.
Ochroma, Calathea, Cecropia
in open along rd.

Tuberodendron on ridge top
leafless. lvs. beginning to come
out, very high buttresses.

Ridge site Rio Rito R. 100+ m
about 4 mi s. Rincon Bay

A site on a ridge has
very tall forest in many
respects similar to that
at Venagas. Vines more
abundant. Undergrowth
rather thick. Layering
indistinct.
Zamia cormosa.
Palms, esp. Asterostigma,
common in shrub layer.
Soil deep, yellow,
fine grained. Erosion
headward, forming
cirque-like valley heads,
very steep-sided
ridges.
Tall forest general
except where slopes are
almost cliffs.
Caryocar has no
buttresses, cylindric trunk,
large, lvs. trifoliolate,
opposite, stipules calyptrate,
caducous.

Tops of ridges flat, narrow.

1966 Costa Rica

May 15 just west of Rincon
Swamp. Tidal
Mora upstream
mangrove down.
Thickets of a slender
spiny Bactris with a large
dark purple edible fruit
(pulp thin, fibrous but
pleasantly acid) Tangles
of a shrubby bignon. Enellagma
with large calabash-like
fruits. Other thickets of
a Randia (steile) and a
bare bignon with white
flowers. Mora still present.
Then a mixture of tall
Rhizophora with zonalary
avicennia. Trees of both to
10-30 m. Most of Rhizophora
have prop roots emerging up to
1 m. and widely arching. A few
have them hanging from
half way up tree.

Hills bet Rincon and
west coast of peninsula
well forested with
Tropical wet forest.
rounded crowns, canopy
complete to perhaps 7 & 70.
Many palms in undergrowth.

Large mangrove swamp
with matrix of mature
open to closed mangrove
forest. patches of dense
young mangrove, and
meadow-like patches
of Acrostichum. But
no obvious belt-zonation.
except taller trees lining
most of meandering channels.
Crowns of mangroves
tall, narrow, spire-like,
except where trees are
well separated, when
they are broad and rounded.

Valleys of Rio Barujo + Rio
Naranjo are broad and flat,
bottoms are planted to bananas,
papayas, oil palms, etc. Hills
are almost entirely denuded.
Much pasture along Rio Naranjo
lower course.
Hills south west of San Jose
are denuded and beginning to
show signs of accelerated erosion.

1966 Costa Rica

Cards typed

May 15 - just west of Rincon, base of Osa Peninsula

in mangrove swamp at mouth of river

47775 Ficus — tangled large shrub or small tree

X 5 occasional in undergrowth

X 4 76 Ardisia — tangled shrub, ripe fruit fleshy, black.

very common in undergrowth

X 3 77 Avicennia — large tree, 20 m. tall, flowers pale buff. leaves pale beneath veins visible above.

occasional

X 2 78 Acrostichum aureum L. — rhizome short, erect, fronds erect, young ones reddish green.

abundant, especially in open areas

X 3 79 (bignon.) Tabebuia palustris Hemsl. det. A. Gentry 1974 — tangled shrub, mound-like, mostly leafless; corollas white, throat rather flattened.

local in undergrowth in open-forest part of

May 15 4 mi. s. of Rincon on ridge along Rio Rizito, base of Osa Peninsula in tall primary "Tropical Wet Forest"

X with W. H. Hatheway 22 80 Dioscorea — slender erect shrub with single main stem, 4-5 m. tall; corollas white.

occasional in undergrowth on steep slope +7, +7, +5

X 8 81 fern Trichomanes diversifrons (Bory) Mett. det. Lellinger 1978. — rhizomes and fertile fronds erect.

common on flat ridge top

X 2 82 (annon.) +1 — slender understory tree, flowers green, stamens cream.

one tree seen

Labels typed

1966 Costa Rica

47783 Psychotria
x 7 on flat ridge top

x 7 84 Duroia
on flat ridge top

x 3 85 Lauranja
rare on flat ridge top

~~Vanegas~~
May 15 Vanegas River

in tall ~~trop~~ primary
tropical wet forest
on very flat ~~gro~~ heavy
clay soil

x17 86 Randia +8, +8, 1

May 16 - headw. of Rio Liquinas,
below Alto de Guayacan,
east of Turrialba
in thick disturbed Tropical
wet forest, ~~with~~ dense
undergrowth

x12 87 Cephaelis +5, +5
~~sp~~ very common

x6 88 Psychotria
common

x4 89 ~~Psychotria~~ Rudgea cornifolia (H. + B.) Standley
occasional det W.C. Burger 1992

x5 90 Blakea
occasional

shrub 3 m. tall;
inflorescences fleshy,
fruit very immature.
shrub 2.5 m. tall
flowers white.
very slender shrub
2 m. tall, flowers white.

100 m

MISSOURI BOTANICAL GARDEN (M

Family: RUBIAC. Country: COSTA

Collector: Fosberg, F.R. 47788 Acronym: US/CR
(return chit to)

Determination: Rudgea cornifolia (H. + B.)
Standley
prev det. R. amplexicaulis

Determined by: W.C. Burger, 1992 Acronym: F

To be completed by MO staff.

☐ ~~Recorded~~ on Computer ☐ ~~Typed on Duplicates~~ ☐ Entered in Field Book ☒ Recorded on Mounted Sheet (or if

ub 3 m. tall,
ale greenish,
llow.

with 3 m. tall.
soft, green-stemmed shrub,
bracts rose-red, corollas white.
low shrub, up to 1 m. tall,
flowers white.
shrub, thickly branched,
2 m. tall, buds yellow, corollas cream
large woody vine, bracts
reddish, fruit pale bronze-
green.

MISSOURI BOTANICAL GARDEN (M

Family: RUBIAC. Country: COSTA

Collector: Fosberg, F.R. 47788 Acronym: US/CR
(return chit to)

Determination: Rudgea cornifolia (H.+B.) Standley
prev det. R. amplexicaulis.

Determined by: W.C. Burger, 1992 Acronym: F

To be completed by MO staff.

- [ ] ~~Recorded on Computer~~
- [ ] ~~Typed on Duplicates~~
- [ ] Entered in Field Book
- [x] Recorded o Mounted M Sheet (or if

1966 Costa Rica

47783 Psychotria — shrub 3 m. tall; inflorescence fleshy, fruit very immature.
on flat ridge top

x7 84 Duroia — shrub 2.5 m. tall, flowers white.
on flat ridge top

x3 85 Laurania — very slender shrub 2 m. tall, flowers white.
rare on flat ridge top

~~Vanegas~~
May 15 Vanegas River — 100 m

in tall ~~trop~~ primary tropical wet forest on very flat ~~gro~~ heavy clay soil

x17 86 Randia +8, +8, 1 — slender shrub 3 m tall, flowers ~~a~~ pale greenish, fruit yellow.

May 16 - headw. of Rio Liquinas, below Alto de Guayacan, east of Turrialba — 750 m
in thick disturbed Tropical wet forest, ~~with~~ dense undergrowth

x12 87 Cephaelis +5, +5 — up to 3 m. tall, soft, green-stemmed shrub, bracts rose-red, corollas white.
~~sp~~. very common

x6 88 Psychotria — low shrub, up to 1 m. tall, flowers white.
common

x4 89 ~~Psychotria~~ Rudgea cornifolia (H. + B.) Standley det W.C. Burger 1992 — shrub, thickly branched, 2 m. tall, buds yellow, corollas cream
occasional

x5 90 Blakea — large woody vine, bracts reddish, fruit pale bronze-green.
occasional

May 16 - forest at headw. of Rio Siquirres, below Alto de Guayacan. 750 m

Slope rather steep irregular forest with almost no canopy, merely abundant emergents from a tangle of tall shrubs, ferns, etc. This tangle is so dense as to necessitate cutting continually to walk. Very few trees over 30 cm dbh.

The forest along the trail is taller and denser, but quite degraded - useful timber has been removed.

above San Jose de la Montaña.

May 17 – W. slope of Volcan Barba. Steinworth hacienda. Around ranch abundant planted Cupressus lusitanica and Alnus jorullensis.

Native forest of Cornus disciflora and Meliandra + associates.

Above at about 1900 m the rather flat interfluve bet. two densely wooded ravines has been cleared and is a pasture of a great collection of widespread weeds – Plantago virginica, Hypochaeris radicata, Oxalis corniculata, Gnaphalium purpureum etc.

The forest – ~~now~~ lower montane wet (5.4) is a dense rather irregular single tree layer, with a well developed shrub stratum about 2–4 m. tall of Palicoureas, Hoffmannia, etc. Forest of Cornus, etc about 20 m tall.

4 Palicoureas a yellow (shrub 2 m.), an orange with red infl. + thicker stipular points, + a purple (P. ang.) and a pale

lavender bush 3+ m. tall. Many epiphytic ferns + Ericaceae.

2000 m. Quercus forest about 20–25 m. tall, with rubiaceous shrub layer 2–5 m. tall, with considerable moss. Looks like forest on Chang'Dao ridge above ~~the~~ tea plantation in Taiwan. Some spots almost bare of undergrowth.

This forest also has Trifinia, Myrsine, Roupala, Guettarda, Magnolia, Cronea, Alnus, Clusia, Prunus, various Melastome and Blakea, ~~Cat~~ Conostegia + Miconia.

Tovomita, Weinmannia, Dendropanax, Oreopanax.

2100 m Lower Montane Rain Forest about 20 m. tall, single tree layer, rather open shrub layer, canopy complete trees somewhat but not conspicuously gnarled, some up to 30–35, rarely more cm dbh spacing 1–4 m. Epiphytes ~~very~~ abundant, trunks thinly but densely mossy.

1+4 m. tall.

Composition very mixed.
~~Has~~ Drimys common one
tree easily 4' dbh x 25' m tall
some lianas - Cyclanthus.
a few Anthuriums.
~~A~~ One old Persea americana.
a few very large trees
here and there.
Rubiaceae, Melastomaceae,
etc. in undergrowth.

Photos of Cornus-Prunus
forest 1 b x w 3 bod.
rounded clumpy dense
tops of trees cornus light green.

with W.H. Hatheway + D. Nicolson

May 17 – above San José de la Montaña, on w slope of Volcan Barba in Lower Montane Wet Forest (S.H.) at edge of pasture · 1950 m

47791 12	(asclep.) +5, +5		woody twiner with white latex; corollas dirty pinkish white.
2	92	(celast.) Microtropis	~~small~~ large tree.
13	93	(ulmac.) (Pteroceltis ? celtidoid) +5, +5, 1 rare, left in pasture	tree 3 dm dbh 20 m tall, fruit green.
12	94	Symplocos +5, +5 occasional	small tree; fruit green.
11	95	Villaresia costaricensis (Citronella c.) occasional +5, +4	medium sized tree, flowers white, fruit fleshy, blue-black, glossy.
10	96	(Theac.) +4, +4 occasional in pasture	small tree, 10 m. tall.
1	97	Palicourea dwol? occasional	shrub under 1 m. tall, inflorescence greenish yellow, corollas lemon-yellow.
8	98	Deppea common	slender shrub 2-3 m. tall, flowers bright yellow (several individual in ~~spe~~ collection).
8	99	Bidens common	scandent suffrutescent herb or shrub, scrambling in trees and pendent, several or many meters long, rays yellow, disk greenish yellow.
47800 8		Morus insignis rare tree, left in pasture	tree 20 m. tall, leaves very rugose; fruit red, pendent.

Labels typed

47801 (rub.)
9 single tree left in pasture

5 02 (~~theac.~~) Rhacoma tonduzii (?)
occasional

4 03 Linociera
rare at this elevation

04 Hoffmannia steinworthii 7 sh.
very local, on bank of stream in dense forest.

6 05 Hoffmannia
local ~~in forest near~~ ~~of~~ stream in dense forest

8 06 (rub.?)
one tree seen in opening near stream.

11 07 Palicourea +4, +4, 1
occasional in forest

3 08 Palicourea
fairly common in edges of forest

1 09 Hoffmannia
rare in forest

6 10 Palicourea
fairly common in forest and at edges of forest X

10 11 Cornus disciflora +4, +4
very common, one of dominants

1 12 Peperomia cf. tetraphylla
occasional, on tree trunks.

tree 15 m. tall; flowers white, drupes bright red.
— small tree
— small, almost leafless tree, fruits blue-black.
— shrub 1.5 m. tall, flowers reddish-orange, fruits reddish black, fleshy
— shrub 1 m. tall, flowers whitish, turning orange, fruit malformed, red.
~~[illegible]~~ shrub 1.5 m. tall, fruit fleshy, dark red, glossy; flowers white.
— shrub 3 m. tall, thyrse red, flowers pale lavender.
— shrub up to 1.5 m. tall, thyrse ~~[illegible]~~ yellow green, corollas lemon yellow.
— shrub, m. tall, scarcely branched. fruit immature.
— shrub 3.5 m. tall, thyrse red, flowers orange.

fairly large tree, bracts whitish, closely investing buds, early caducous; fruit immature.
— leaves fleshy

X 47813		Palicourea	
2		occasional in edges of forest	
X2	14	~~Dig~~ Didymaea +1 common on base of tree in pasture	shrub less than 1 m. tall, thyrse yellow-green, flowers lemon yellow. creeper, fruits blue.
X3	15	Viburnum occasional	small tree, fruits black
X5	16	Palicourea common in edges of forest	shrub 3 m. tall; thyrse red; corolla orange.
X4	17	Palicourea angustifolia occasional	shrub 3 m tall; thyrse reddish, corollas magenta.
		same, oak forest	2050 m
X4	18	Guettarda poasana edge of forest	large tree; corollas purplish outside, lobes white, crisped; fruit black.
X5	19	Blakea occasional in edge of forest	large vine on trunk of tree, petals white, fruit red.
X6	20	~~[illegible]~~ Rondeletia occasional glaberrima Pittier	small tree, flowers white.
		same	2000 ~~1975~~
X7	21	Hoffmania steinvonthii very local in dense forest on bank of stream	shrub 1.5 m. tall, flowers dull orange. fruit globose, fleshy, reddish black. (Lectotype)
X2	22	? very rare	shrub less than 1 m. tall, sterile.
X6	23	Hoffmannia very local on banks of stream in dense forest.	shrub 1.5 m. tall; flowers dull whitish; fruit immature.
X3	24	Cephaelis axillaris occasional in dense forest	green-stemmed low shrub, bracts dull purplish, corolla white.

Labeled ✓ typed

1966 Costa Rica

47825		Palicourea occasional in Quercus forest	
x4			
x9	26	Guettarda poasana occasional in Quercus forest	
x2	27	Uncinia common on wet ground.	
		same - dense mixed Cowes Montane Rain Forest.	2100 m
x2	28	Persea americana ? rare	
x2	29	Hoffmannia rare	
x1	30	Burmeistera very rare on moist ground	
x2	31	Nertera very local	
✓1	32	? rare	
x3	33	Palicourea occasional	
✓2	34	? rare	
x4	35	Palicourea occasional	
x7	36	Palicourea occasional	
x4	37	Centropogon occasional	

shrub 3 m. tall. thyrse red, corollas orange-yellow.

large shrub; flowers white, lobes with crispe margins, purplish outside, fruit black.

great broken-off trunk with large sprouts, leaves glaucous beneath; sterile.

erect shrub 2 m. tall, buds orange-red, corolla bright yellow.

prostrate, fruit red, juicy.

shrub 1 m. tall, buds greenish.

shrub 3 m. tall, ~~flowers~~ thyrse red, flowers pale lavender.

small shrub; sterile.

shrub 4 m tall. thyrse green, corollas yellow.

shrub 3 m. tall, thyrse yellow-green, corollas yellow.

herb 0.7 m. tall, corolla scarlet, lobes of ovary yellow.

1966 Costa Rica

47838 Palicourea
occasional

May 18. Volcan Irazu (Irazu)
with W.H. Hathaway & D.H. Nicolson
in deep volcanic ash on crater rim — 3200 m

77 Arctostaphylos
common — sprouting shrub, flowers cream white.

40 Vaccinium
common — sprouting shrub, fls. cream white, berries blue.

41 Lobelia laciflora
very common on road cuts — 2100 m — shrub up to 1 m. tall, sparsely branched, corollas scarlet.

May 18 Volcan Irazu
along highway to summit

41a Coriaria ruscifolia
common ~~from~~ in a very limited area along road cut — scrambling semi-scandent

shrub 2 m. tall; thyrses red, corollas lavender.

1964 Costa Rica

May 18 - auto trip up Pacuare V.

Just before Cartago road crosses a wide stream bed, site of 1964. mud flow. This is contained between high levees pushed up by seabees on AID program.

Trees in Cartago
Araucaria excelsa
Cedrela sp.
Casuarina equisetifolia
Salix chilensis
Persea americana.
Tecoma stans
Schinus molle
Cupressus 'Guatemala Cypress'
Roystonea oleracea
Phoenix canariensis

lower slopes above Cartago 1500 - 1800 m grassy pastures and cult. patches separated by hedgerows and wooded ravines, Lower Montane Moist Zone (S.H.) (1600 - 2300 m range acc. Hathaway) (Potatoes, onions, etc. cult. + good pastures, not too much leaching). Deep ash soil.
Most of ash was blown directly over Meseta Central and San Jose.

Lobelia laxiflora on cut banks at about 2000 m. - 2150 m.

Carica cf. candamarcensis at about 2200 m.

At 2350 m - 2500 m, + the oaks-filled ravine seems still in good shape.
above ~~2350~~ 2350 Acnistus lines road in places.

Above 2400 m Montane Wet Forest Zone (S.H.). Indicated by Buddleja sp. (tree, gray lvs) (B. alpina?)

2400 m. oaks in ravines and scattered on slopes. Slopes grassy. ~~too~~ mostly Pennisetum clandestinum. Some cultivation.
2700 m Alnus and oaks, Buddleja scattered on grassy slopes. Horizontal ditches on pastured slopes are quite conspicuous. Constructed to stabilize slopes and prevent mud flows.
At 2840 m. Coriaria lines road. Escallonia begins here.
Pennisetum colonizes ash very well here.
Gunnera in ravines.

1964 Costa Rica.

Around toward east is an open forest to savanna of Buddleja, oaks, araliad. Buddleja becomes dominant until it is essentially an open Buddleja forest.
Above this ash beds half covering open scrub. Most of shrubs are sprouting. Lupinus and Deschampsia (?) colonizing ash at 3450' m. + up. Upward the sprouting is less pronounced, but still many shrubs are sprouting, even on crater rim.

Inside rim most of the vegetation is gone - the slopes on which I collected in 1962 are just bare ash. At top of road, ~~and~~ below observation platform are a few stubs some of which are sprouting.
Ash flat just back of where old observation point was is bare.
Arctostaphylos on rim as sprouting and flowering. Vaccinium consanguineum also flowering.
No colonization on rim but down just a little lupines, several grasses.

photos b + w + color outside slope and inside

Rumex acetosella, gnaphalium sp. are colonizing actively. However, a half dozen cattle were grazing on this along road.

What appears to be Eupatorium adenophorum in Buddleja forest.
Locally much Escallonia in Buddleja forest. Myrsidendron seems often epiphytic on or in some way associated with Escallonia.

Tricholaena rosea on roadside bet. Cartago and San José.

May 29 - just north of Gooney Run Overlook
Trees almost fully leafed out, except some oaks that are still somewhat bare-looking. Many roadside flowers out.

Lands Run Gap and Fire Road -
collected several plants in gap, then several a few hundred yd. down, in a road cut and embankment. Stellaria pubera fruiting - the fruiting branches procumbent. The sterile ones erect. Equisetum on a loose road fill.

Lands Run Falls -
a beautiful series of falls and cascades below Fire Road where it crosses the run. A "bathtub" at top of falls.

Bet Compton gap & fenting a thinly wooded flat with Kalmia and Rhododendron ~~[illegible]~~ forming a well marked lr. m shrub layer. Rhododendron mucronatum but variable in flowering

~~70~~ 2100'

time and color - paler ones in full flower, pinker ones about over. Odor varies but no strong clove odor.

L. of Jenkins Gap on a gentle w. slope, colony of R. roseum in rather thin woods. ~~[illegible]~~ Varys somewhat in color, sl. tinge of orange in some. Clove scent.

Flat along Smith-Road Fire Road south of High Top. Very rocky old orchard, now grown up to a thin stand of small Robinia 5 in. tall or so. and Rubus argutus.

Farther down, near top of steep slope - ground even more rocky, a thin stand of oaks on almost bare rock near top of low cliff. Farther away some Robinia and then almost pure stand of young ash. Botrychium virginicum common. Thalictrum cf. dioicum. Smilacina racemosa.

to p. 62

May 29 – Skyline Drive – just north of Gooney Run Overlook in grassy area along ~~Skyline Drive~~ highway

47842	~~[illegible]~~ Viola triloba Schw. common	petioles erect; flowers purple.
x 3		
x r 43	Carex occasional	culms spreading to ascending.
x 2 44	Carex occasional	– plant caespitose, culms spreading.
x 1 45	Cerastium occasional	– plant weak; flowers white
x 2 46	Geranium common	stems spreading from slender root crown; flowers deep rose.

same - in thin oak forest on rocky ground

x 4	47	Lathyrus? locally common	flowers magenta
x 3	48	Vicia locally common	flowers pale lavender.

May 29 – Gooney Run Overlook, Skyline Drive in grassy area, semi-open.

x 4	49	Trifolium abundant in patches	flowers light yellow.
x 1	50	Lagina common	flowers white
x 4	51	Lepidium abundant in patches on otherwise bare soil	erect; flowers yellow.

nos. checked 52
labels typed for Xerox

		1966 Virginia	
	47852	Tragopogon rare	erect, ~~fl~~ ligules yellow.
X1	53	Oxalis occasional	flowers bright yellow.
X3	54	Crataegus one tree seen	small ~~[illegible]~~ closely branched tree; petals white, anthers dull purple.
X1	55	Maclura pomifera one tree seen	small tree; bark dull yellowish; sterile, leaves not quite mature.
X1	56	Gleditschia triacantha one tree seen	small scraggly tree with branched thorns on trunk.
		same - on boulder talus below overlook	
X3	57	Bromus abundant	spikelets drooping
X5	58	Hesperis one large patch	flowers varying from white to deep magenta in same colony.
		May 29 - Land's Run Gap in thin second-growth forest	
X1	59	Barbarea vulgaris one plant seen	flowers pale yellow.
X3	60	Barbarea vulgaris common along road ~~in~~	flowers bright yellow.
		May 29 Lands Run Fire Rd.	
X3	61	grass very common on fill along road	erect, small tufts.
X3	62	Equisetum arvense local on fill along road	

nos. checked 54 typed for Xerox

1966 Virginia

47863 Stellaria pubera
x5 common on road cut and roadbed

May 29 - Lands Run Falls, on Lands Run Fire Rd. in dense forest

x1 ~~64~~ Carex
on rocks near stream

x1 65 Barbarea
occasional in road

x2 66 Galium aparine L.
occasional in weeds along road.

~~67~~

May 29 - Skyline Drive between Compton Gap and Jenkins Gap in ericaceous shrub layer in thin oak forest

x2 67 Rhododendron nudiflorum
common

~~x 68 Antennaria~~
~~rare~~

x1 68 Antennaria
rare

x2 69 Rhododendron nudiflorum (L.) Torr.
occasional

May 29 - Skyline Drive, milepost 16, bet. Jenkins Gap and Hogwallow Flat Overlook in scrubby forest on gentle west slope

sterile shoots erect, fruiting ones procumbent.

caespitose, culms strongly ascending.
— erect, flowers bright yellow.
— weak, supported by weeds.

shrub 2 m. tall, corolla tubered, limb pal pink; odor not very good.

stem prostrate, scaly erect.
— shrub 1.5 m. tall, flowers pink, tubered, odor not very good.

1966 Virginia

x1 47870 Rhododendron roseum
common

x1 71 Maianthemum canadense
very common

x2 72 Rhododendron roseum
common

May 30 - 3/5 mi. s. of Hightop
head of White Oak Spring Branch
in thin oak forest on
rock outcrop
soil only in pockets and thin sheets

x2 73 Rubus idaeus L.
occasional

x4 74 Rubus
very common

x5 75 Sanguinaria canadensis
abundant, rhizome
in crevices between rocks.

x3 76 Potentilla simplex Michx.
common locally

x1 77 Arisaema triphyllum L.
rare

x2 78 Carex
common on rock ledges

x1 79 Arisaema atrorubens
occasional

x1 80 Puccinia
parasitic on Arisaema atrorubens

shrub 2.5 m. tall,
flowers bright rose
pink, odor of cloves.

shrub 2 m. tall
flowers bright pink,
odor of cloves.

945m
3100'

canes sprawling, rooting at tips,
leaves white
beneath, flowers white.

canes sprawling to
prostrate, rooting at
tips; flowers white.

rhizomes dull orange red,
latex reddish, leaves
glaucous beneath.

stems low arching to
procumbent, flowers yellow.

leaves clear green beneath,
spathe green, not well
opened (abnormal?).

leaves glaucous beneath,
spathe deep purple, stripes
with white.

		1964 Virginia atrorubens	
47881		Arisaema atrorubens ?	leaves scarcely glaucous, but not quite clear green beneath; spathe purple, striped with white inside.
X 1		occasional	
X 1	82	Arisaema atrorubens ?	leaves scarcely glaucous but not quite clear green beneath; spath green.
		occasional	
X 1	83	Carex	small tufts, culms spreading; slightly glaucous.
		rare	
X 5	84	Carex	large rather loose tufts, culms ascending.
		occasional	
X 5	85	Ranunculus ~~abortivus~~ allegheniensis Britt	petals yellow.
		locally common ~~locally common~~ ~~Desc~~	
X 2	86	Ranunculus abortivus L.	petals yellow
		locally common	
X 2	87	Woodsia obtusa ?	
		rare, at top of small clifflet.	
X 1	88	Viola palmata L.	flowers purple, lower three petals white at base, lateral ones bearded, lower striate with black.
		rare	
X 1	89	Lobelia virginica (L.) Rollins	flowers white
		rare	
X 1	90	(grass)	erect
		rare	
		same - in thin Fraxinus forest with some Robinia, on	very rocky ground
X 5	91	Carex	loose tufts
		along old road	
X 4	92	Carex	loose tufts
		along old road	
5 X	93	Carex	culms spreading, plant somewhat glaucous
		in deep leaf mold	

945 m.
3100'

		1964 Virginia	
	47894	Viola common in old road	leaves erect; flowers purple, lateral petals ~~bearded~~ at base, lower one striate with black on white at base. (possibly 2 species?)
X1	95	Viola triloba ~~Schw.~~ Schw. rare in old road	leaves erect; fls. purple, petals white at base, lateral bearded, lower striate with black.
X4	96	Rhododendron nudiflorum rare	945 m. 3100'. shrub 2 m. tall; corolla tube red, ~~petals~~ ~~very~~ very pale pink, ~~very~~ upper one very ~~slightly~~ slightly yellowish in center, not at all clove scented, odor faintly unpleasant.
X4	96	Rhododendron roseum rare	shrub 2 m tall, flowers bright pink, tube deeper, upper lobe with orange patch in center, clove scented.
X1	98	Ranunculus bulbosus common in old road	flowers yellow, showy.
X2	99	Prunus virginiana occasional	shrub 2.5 m. tall.
	47900	Sambucus racemosa rare in undergrowth	shrub 2.5 m tall, fruit immature.
X2	01	Viola rafinesquei very local at roadside	
X1	02	Veronica peregrina L. rare along old road	
X4	03	Senecio aurea common, especially along old road	erect, flowers deep yellow.
X1	04	Smilax herbacea rare	erect, subglaucous

1966 Virginia

ctd. from p. 49.
Cimicifuga, Aster
macrophyllus (a),
Sanguinaria (o)
Galium aparine (o)
Prosteum perfoliatum (l)
Hydrophyllum virginianum
(c), Clematis, Rhus
trichocarpa, Dioscorea
quaternata

Understory of crataegus
and Hamamelis. Ostrya.

Apparently there has
been a hard frost after
things began to grow
this spring. Many
Smilacina and other
herbs seem to have been
frozen back. Carya ovata buds
killed. Perhaps this
is the reason the oaks,
Robinia, etc. show little
sign of leafing out yet.

Fire road here, in
and immediately alongside
Ranunculus bulbosus, Cerastium
viscosum (!) Taraxacum.
Poa spp. Hieracium pratense
Fragaria, Viola spp. Fragaria,
Allium vineale, Veronica
peregrina. Achillea millefolium,
Viola rafinesquei, Panicum sp.

~~Just below~~

Just below top of High Top
on Appalachian Trail is a
rock shelf like a diminutive
Crescent Rocks. but has a
poor flora — Gaylussacia baccata
Sedum telephioides Spiraea betulaefolia
Pyrus (arnia) (glab.)
Pyrus americana
Solidago roanensis v. monticola
Maianthemum
Quercus rubra
Betula lenta
Dennstaedtia punctilobula
Carex spp ?
Menziesia pilosa

		1966 Virginia	
		from p. 66	
	47905	Lepidium	erect
X1		rare, near old road	
X2	06	Poa	erect
		common near old road	
X1	07	Thalictrum dioicum	mostly not yet flowering, roots yellow.
X4	08	Prunus serotina	small tree, petals white; twigs with very strong odor when broken.
		occasional	
		May 30 - south slope of High Top in thin second-growth oak woods	
X7	09	Veronica peregrina	erect; corollas blue, falling easily.
		abundant along Appalachian Trail	
X7	10	Tradescantia virginica	petals deep purple. (varying to paler and to dull or bright rose pink), filaments with copious purple hair, anthers yellow.
		occasional	
X2	11	Tradescantia virginica	petals deep rose pink, (varying to dull rose pink, light blue-purple and to deep purple), filaments with copious deep rose pink hair.
		occasional (with #47910)	
		May 30 - near summit of High Top on ledges in rock cliff	
X3	12	Carex	forming turf
		small patch	
X2	13	Carex	small tufts
		a few tufts	
X3	14	Menziesia pilosa	shrub, ov. cal., corollas yellow with coral tips

to p. 68

1966 Va. Shen. Nat. Park

May 30 Hog's Top
Upper part covered with scrubby oak forest - the older trees showing typical low stature, thick conical trunks of high place. Betula lenta and alleganiensis occasional. Thin low shrub layer of Corylus. Herbs abundant. Oaks scarcely starting to put out leaves. Corylus & Betula with half-grown leaves.
The tower has been taken down.

Trails of South River Picnic Ground, just s. of Baldface Mt Overlook
An old clearing on w. side of Drive - 3200'
filled with Crataegus, Rubus, Prunus, etc.
a queer glandular Rubus is common.

June 12 - Potomac River above Shepherdstown
Nichi Wilson place, Steamboat Run Estates.

Botrychium virginianum
Acer nigrum
Quercus prinus
Asimina triloba
Parthenocissus quinquefolia

Not checked
ready for Xerox

1966 Virginia
from 1964

47915		Carex	small tufts
X2		on shaded ledge	
		same – in scrubby oak forest	
X1	16	Zizia aptera (Gray) Fern. common	flowers clear yellow.
X1	17	Zizia aptera (Gray) Fern. forma rare	flowers rusty yellow.
X1	18	Thaspium barbinode (Michx.) Nutt. common	flowers pale yellow.
X1	19	Cypripedium calceolus var. pubescens (Willd.) Conell rare	perianth segments brown. lip yellow.
		May 30 – 3/5 mi. s. of High Top in scrubby oak forest	
X4	20	Pyrus malus L. occasional	small tree, fruit immature.
		May 30 – Smith-Roach gap in grassy opening	
+7	21	Crataegus occasional	shrub 2 m. tall; petals white; anthers dull pink.
		May 30 – 1 mile n. of South River Picnic Grounds old clearing now choked with Rubus and Crataegus	
X4	22	Rubus ravus Bailey? locally abundant	canes, stout, erect, to 2 m tall, slightly arching at tips.
X7	23	Crataegus locally abundant	shrub 4 m. tall, flowers white, anthers purple.

checked

ready for xerox

1966 Virginia

May 30 - east side of Hawksbill Mt., M.p. 47 on Skyline Drive.
in wet boggy spot beside road

47924 Viola
occasional — flowers purple.

25 Viola
common — flowers purple, white in center, lower petal striate.

26 Carex

1966 District of Columbia

label written

June 4. Capitol Hill

27 Lepidium sativum L.
weed in garden — petals white.

1966 Virginia

June 17 - Ravenswoth Shopping Center
Braddock Rd. & Beltway
In the south west
quadrant (away from
Wash., away from Alexandria)
is a large tract of
good old second-growth
mixed hardwood
forest. Variable in
composition - beech
locally common.
In some areas there
is an under-layer
of Ilex opaca.
Polystichum acrostichoides is common, locally
abundant. Shrub
layer is so thin that
walking is ~~abundant~~
very easy.
A small stream
cuts across it, lined
with willows and
some open herbaceous
vegetation.
Rotted fallen trees
are abundant.
Lonicera japonica
rather abundant
along stream and
on edges toward
Braddock Rd.

June 20 - left Wash. 6 p.m. left
Dulles 7:20 p.m. Delay in N.Y.
June 21 - arrived Paris
12:15 p.m. left Paris
1:40 p.m. arr. Geneva. 2:40

Overcast and slight rain
at Orly.

1966 ~~[illegible]~~ Fraxinus

June 21 T.e above Thoiry slope of Jura Mts. west of Geneva.

375-500 Intensive cultivation on glacial terrain at foot of mts. Lower slopes more or less open but no longer cult. Some grazing. invasion by Crataegus, Juniperus, Corylus etc. from hedges forming woodland, tending to go back to forest. above this a belt of deciduous forest - Quercus with Fraxinus, Tilia, Acer, etc.

850 m + up Above this a belt of Abies. Above the Conifer belt is a belt of meadow and snow patches. but in places scrubby + mixed decid. + conifers. In the deciduous forest belt many chestnut but are being slowly eliminated by blight.

The scrubby belt above the conifers is well developed in some areas, in others pushed down by grazing and even cutting. The grassy ~~at~~ summits are kept so by grazing, but the

woody species grow very slowly here.

At 1300 m. the abies begins to give way to Picea. Fagus becomes abundant and co-dominant in forest. Here rain is ~~[illegible]~~ about 2 m and there ~~is~~ is a boggy moss coating on rocks. This is limestone country and ~~[illegible]~~ in spite of this Vaccinium myrtillus is abundant. No pine but both abies + Picea are common. The forest is rather open with still a ~~sparse~~ ~~[illegible]~~ undergrowth. Lonicera nigra, Rosa sp. (almost without prickles) A couple of saxifrages. Paris quadrifolia. Beeches here are ~~[illegible]~~ small-leafed, almost look like Nothofagus.

1100 m meadow with Gentiana lutea, Galium boreale, etc.

now checked
labels typed

1966 France

June 21 – s.e. slope of Jura Mts.
above and s.w. of Thoiry
w. of Geneva.
in coniferous forest

	47928		Cotoneaster tomentosa on open limestone exposure	950 m shrub 1 m. tall, bushy, – buds white.
X	X2	29	Viburnum lantana ~~very common in~~ occasional in scrubby spot	1000 m shrub 1.5 m. tall, fruit immature
X	X4	30	Laburnum very common in scrubby areas	1050 m large shrub, 3-4 m. tall, racemes pendent, flowers – bright yellow.
	X2	31	Lonicera occasional in scrubby area	1200 m shrub 1.5 m. tall, fruit immature.
X	X1	32	Ranunculus common in openings	1250 m flowers white.
	X1	33	Ajuga in open meadow	1100 m. flowers deep blue-violet.
	X1	34	Lamium in open meadow	1100 m flowers yellow marked with red.
	X2	35	Galium boreale L. common in open meadow	1100 m flowers white.
	X1	36	Asperula on limestone rocks in opening	1300 m flowers white.

to p. 116

1966 Switzerland

June 25 - left Geneva 6:43 am (taxi 5 fr.) by rail. (fare to Vienna 77.20)
Skirted Lake. The country is in very attractive estates with large houses, gardens, fields (wheat - headed but still green, hedges. bits of woods.
Soon left lake shore. Some large apartments.
Then intensively farmed country with pasture wheat, a little maize, alfalfa, and some orchards. Approach lake again. Some vineyards on s. slopes.
Nyon
Terrace along lake intensively farmed - wheat, some barley, oat, alfalfa. All but the most gentle south slopes are in vineyard. Higher slopes of range paralleling lake shore wooded.
After this range is passed the country generally is in grain. A small river ravine partly wooded.
As far as Lausanne the pattern is this sort of farming - not much

vineyard, as there are few slopes steep enough. Route is away from lake. Some small bits of wood.
Lausanne is a large
7:25 city.
Some higher mts. now visible across the lake. The smaller houses along r.r. have very nice gardens. Most have some vines and fruit trees, as well as flowers and ornamental trees.
A deep ravine just out of Lausanne running down to lake. r.r. climbs along a fairly steep slope through vineyards. Skirts lake on this slope, which is probably 300m or so high. Some small bits of woods + pasture where slopes swing to north or are precipitous.
Left lake at
and into hilly area that is largely wooded with Fagus, some pasture. Then a wide rolling hilly area mostly pasture + some grain on flatter part. Some hedgerows. Steep slopes wooded, largely beech. Some conifer plantations.

1966 Switzerland.

No particular pattern except that most of flatter ground is cult. Much of forest now is coniferous - clearly planted, some on rather flat ground. Mixed Abies + Picea.

This rolling landscape is very extensive. No very high or rugged mts to be seen. Rt. is climbing. Perhaps half the land is cult. or in places 3/4 or more. Some small orchards. Much pasture. Hedgerows of trees.

Vanderens.

Some conifer forest, then mostly beech. Much pasture, then mostly cultivation - esp. grain. High mts visible in distance to rt.

This beautiful green rolling landscape continues for a long way.

Romont.

A few scattered large buildings - factories, clumps of apts. More rolling, cult, partly wooded land. Gradually becomes more hilly + more wooded.

Rosé. Rolling and mostly open again.

Fribourg

A notable river just beyond Fribourg. Then further rolling - hilly country.

Schmitten

More hilly, more wooded. - or in hollows a ravine. Forest mostly beech. Continues to get more hilly. Some beets + potatoes, as well as grain.

Flat-lying alluvial bits. Then much less relief. Wide flat land around Bern.

8:33 Ar. Bern.

8:57 left Bern for Lucerne.

Partly cult. (on more level land) partly mixed wood, mainly beech + evergreens (on steeper land).

Following wide valley. Very rugged partly snow-covered mts, in distance to left. Rt. is climbing. Some planted forest even on rather level land. Mostly mixed cult. on valley floor + gentle slopes.

Worb 599B

Jägertschi

Country becomes more hilly. Nice little red-roofed villages.

Konolfingen.

1946 Switzerland

Long rather narrow valley, cult on floor + lower slopes, ridges wooded.
Valley gets more hilly
Emmenauf.
River.
Rather steep slopes cult. + in pasture.
Langnau.
Following river. Hills become abrupt, valley narrows. Potatoes much cult. also some beets.
Valley narrows and becomes a canyon. Sides wooded, steep. only lowest slopes cult. + where there is a flat bottom.
The valley seems to be headed up into higher mts.
Scenery is becoming spectacular.
High wooded slopes, steep green meadows. + rest mostly coniferous - Picea.
Then a broad more open valley with gentler slopes. Pasture and hay meadow. This continues a good distance.
Schüpfheim
Entlebuch
River gorge in flat alluvial beds. Occasionally one sided cliffs and slopes.
Wolhusen

Gorge becomes more spectacular. Walls mostly wooded. Bottom narrow + flat. Forest mostly beech.
Broadens out again; slopes more gentle, grassy with rows of trees. Some mixed coniferous + beech forest on slopes. Other hardwoods on flat ground.
Littau.
Valley much wider but rather hilly. Hills pastured + wooded, flat bottom cult.
Orchards and grain. Orchards with dense grass ground cover.

1966 Switzerland

June 25 - trip by boat on Lake ~~Lucerne~~ (Lake of the 4 cantons)

This is a winding lake between enormous peaks and limestone cliffs. Parts of the shore are sloping up to green meadows on mountain sides with forest on steeper parts and in ravines. These slopes were farmed until roads were built into the area. The farming was poor and when it became possible to bring in food from the outside, the farming was changed to dairying, resulting in the present meadows.

The forests on the Lucerne end of the lake are almost all Fagus at anything like the elevation of the lake. Higher up are mixed spruce + beech and spruce forests. The belts of vegetation tend to be lower ~~at~~ on the north and south sides of the Alps and higher in the interior where the climate is more continental. Lake Lucerne is about on the transition between oceanic and continental climates and on the far end of the lake Pinus sylvestris tends to replace the Fagus. This is

strikingly shown on steep ridges that run down to the lake, where there is beech on the north side and pine on the south. Pine also where the soil is very thin, - growing on limestone.

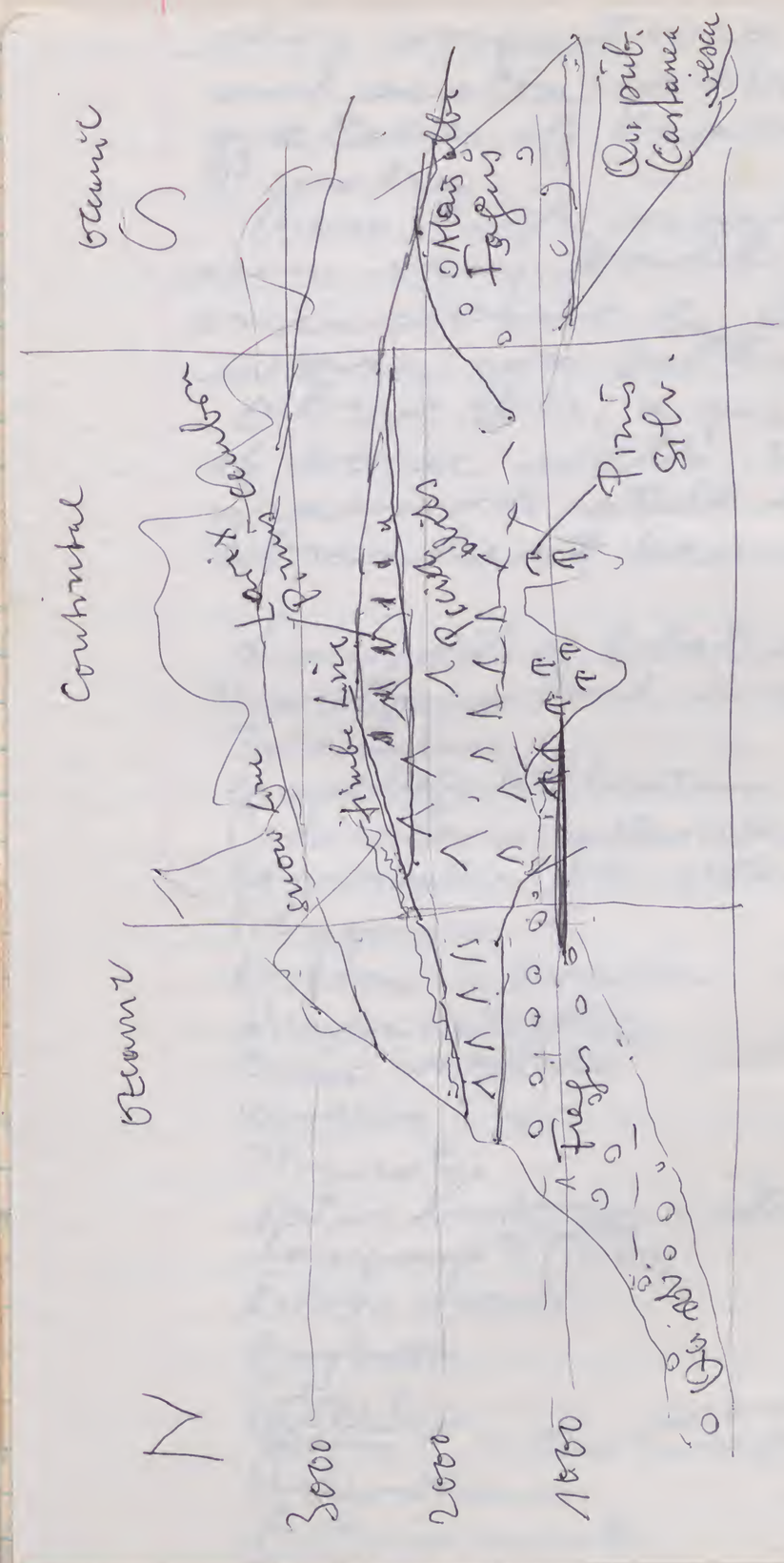
Where the cliffs are wooded but so steep that neither man nor his domestic animals can go readily the forest is in an almost virgin condition, at least as far as composition is concerned.

On high steep slopes are grassy strips running vertically between strips of forest. These grassy areas are kept clean by avalanches, grazed in summer. (Data interpreted by Heinz Ellenberg).

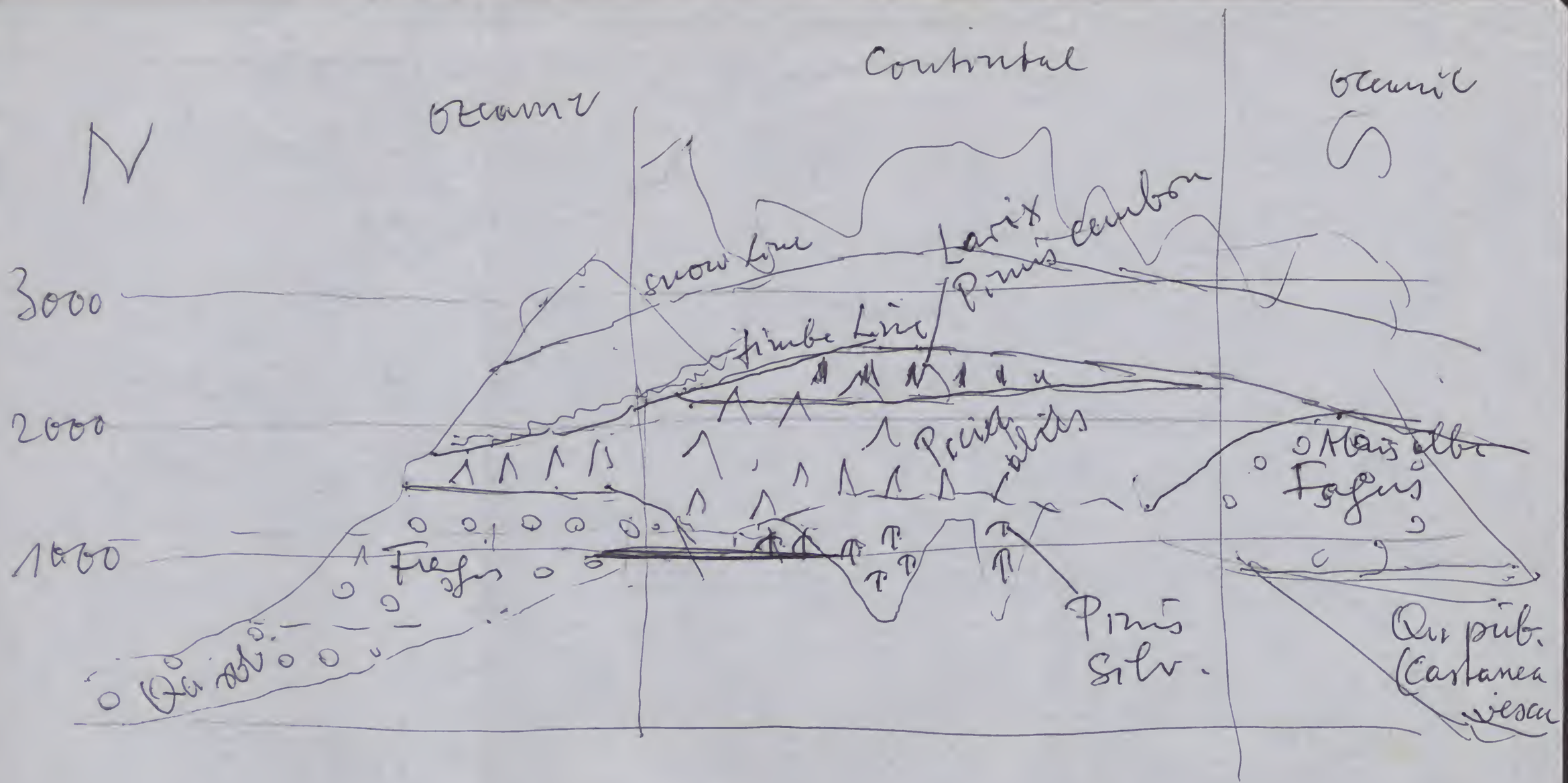
Some beautiful folding and fault patterns to be seen in the cliffs ~~in~~ along the lake. Limestone shows some chimney erosion but few karst features.

1966 Switzerland

June 23. Trip up Mt. Pilatus
Left Lucerne by boat, 7:15 a.m.
to Alpnachstad. 7:40
Cog railway to Pilatuskulm.
At base of railway the rock
is a thinly bedded phyllite
shale. Plants on this in
crevices and on slight
accumulations of soil.
2 spp. Hypericum in flower.
Silene.
Steep meadows with
a number of species of
herbs in flower.
Beech forest with a
little spruce locally.
Some admixture of oaks,
Sorbus, Acer, etc. Fraxinus.
Little or no undergrowth
and only a thin herb layer.
Rock changes to limestone
a little way up.
Forest becomes scrubby
and mixed upward.
Then more & more conifers.
Upper meadows have
many showy flowers.
Above Pump Station
the forest is spruce
Spruce gradually
and irregularly thins
out, is replaced by
open meadows, scattered
bushes of juniperus, this



+ ilipendula


Continental
Oceanic
Oceanic
N
S
3000
2000
1000
snow line
timber line
Larix
Pinus cembra
Picea abies
Abies alba
Fagus
Fraxinus
Quercus
Pinus silv.
Qu. pub.
Castanea vesca

1966 Switzerland

June 27. trip up Mt. Pilatus
Left Lucerne by boat, 7:15 a.m.
to Alpnachstad. 9:40
Cog railway to Pilatuskulm.
At base of railway the rock
is a thinly bedded phyllite
shale. Plants in this in
crevices and on slight
accumulations of soil.
2 spp. Hypericum in flower.
Silene.
Steep meadows with
a number of species of
herbs in flower.
Beech forest with a
little spruce locally.
Some admixture of oak,
Sorbus, Acer, etc. Fraxinus.
Little or no undergrowth
and only a thin herb layer.
Rock changes to limestone
a little way up.
Forest becomes scrubby
and massed upward.
Then more & more conifers.
Upper meadows have
many showy flowers.
Above Bump Station
the forest is spruce
Spruce gradually
and irregularly thins
out, is replaced by
open meadows, scattered
patches of juniperus, this

very compact and prostrate
and scattered open
patches of Pinus, prob.
P. cembra.
These high meadows
seem very badly overgrazed,
crisscrossed by deeply
worn cow-paths. Ranunculus.
Above this, a great deal
of scree with thinner
grass and still very
abundant Ranunculus.

Summit of Pilatus
Poa alpina (incl. viviparous form)
Taraxacum
an umbellifer like Sanicula
Pedicularis (yellow & purple)
Ranunculus (2 spp. white + yellow)
Polygonum
Sagina ? or Arenaria
Dryas octopetala
Carex compacta
Woodsia ? sp.
Myosotis
Salix herbacea + retusa
Saxifraga ? aizoides 2 spp.
Silene acaulis
~~Oxytropis~~
Lotus ?
Erinus ? Kouthingia or other white Arabis ?
Cruciferae. 2 spp.
Helianthemum
Scleria caerulea
Filipendula

Anemone (white)
Trollius
Galium
Doronicum
Draba
Cerastium
Arenaria a alsine?
Festuca cf. pumila

Alpine chough - black jay-like bird with wing and tail feathers spreading in a palmate fashion - dozens of them playing in the wind, soaring and wheeling, apparently just for the pleasure of it, around the summit ridges.

July 2 - small boat trip around north shore of lake Lucerne Lido - Seelburg - Hermitage across lake to Tribschen. back to Lido and back to Lucerne.

Lower slopes a mosaic of beech woods and open green meadows. Many large houses scattered in the landscape, the whole with a landscaped appearance. Quite a mixture of trees along the lake shore. Populus, Salix, Picea, Tilia, Prunus, Acer, Abies, Aesculus, Betula.

A swimming beach beyond Lido with hundreds of people enjoying the sun.

Patches of Phragmites here and there along the shore in the water.

In Lucerne Rhus typhina is cultivated and makes a very attractive ornamental shrub.

1946 Switzerland

July 2 – rapid train Lucerne – Zurich
left Lucerne 7 p.m.

Mixed forest and houses – the forest locally pure beech, locally pure spruce, locally mixed. Narrow lake a dammed river on left, ending in a marsh, then a flat narrow valley, a slope of 50 m. or so on left. Valley widens gradually. Spruce forests on higher slopes, grass on lower. Cultivation and grass in bottom, scattered fruit trees & houses, villages. Then a river on left. Valley becomes very wide r. on rt. side. Widens into a somewhat rolling plain. Then a lake on rt. Scattered small areas of wood – beech & spruce, and of orchards. Mostly grass, some wheat, potatoes, etc.

(stop) – Cham.
Large lake on rt. Some reed marsh along shore.

– Zug
Hill on rt. with areas of forest, wide plain on left, with orchards, grass. The orchards are apparently pastured, and have dense grass ground cover.

Smaller wooded hills on rt. Then rolling hilly country on left; valley on left. Hills partly orchard and grass, some woods.
Climbing, dense mixed wood on rt.
Long tunnel. Came out in a wooded ravine at Sinsburg. Wooded high hills, small river.
Another long tunnel.
Came out on left side of large valley with a large lake. Wooded partly grassy slope on left. Houses below to lake shore. All sides of this lake seem to be rather thickly populated.
– Thalwil
Houses all have nice gardens, fruit trees, grape vines, etc.
A small vineyard on east slope
Hay mowed and drying on r.r. cut.
Zürich-Wollishofen
– Z.-Enge
– Zürich
r.r. Zurich to Buchs
left Z. 3:41 p.m. Lake on left.
Same route as far as Thalwil.
From Thalwil followed lake shore
Richterswil
– Langen
– Buchs 10:16 p.m.

1966 Switzerland – Liechtenstein

July 3 – r.r. trip Buchs – Vienna.
Left Buchs 9.35 a.m.

Buchs is an attractive small city in the bottom of a wide U-shaped valley, surrounded by spectacular towering mountains, with bare cliffs, grassy slopes, and forests. The valley floor is flat and quite intensively cultivated.

Crossed bridge over the Rhine into Liechtenstein, going down the same valley, then up a side valley – (Jee R.) really a wide extension of the Rhine Valley. Steep slope on rt. covered by a mixed forest of Larix, Picea, Pinus sylvestris, Sorbus aucuparia, Betula, etc.
Valley floor a debris fans, of grayish glacial till, covered by orchard, with grass, and towns + villages.
On east-facing slope forest is mostly beech mixed with conifers.
On west facing, predominantly conifers.
– Feldkirch. (Austria)

Followed Jee V. – lined by beautiful mountains. River rather milky with glacial silt. Valley broadly U-shaped. River lined by mixed deciduous thickets. Forest on mountain slopes mostly coniferous.
– Frastanz
Valley bottom cultivated and pasture, but with thickets and bits of woods. Slopes patchy with meadows, woods, scattered trees.
In valley – potatoes, maize, some kind of grain, pasture. Deciduous thickets, woods mixed deciduous + conifer. Considerable snow on higher mts.
RR follows rt. side of broad Jee valley, at bottom of very rugged slope, then swings left across the river, through forest on glacial gravel. Largely Picea, some Pinus sylvestris. Then large meadow area with patches cultivated. Village.
Limestone hill on left with Pinus sylv. – really a spur of mts. other slopes with spruce forest. Small town in corner above it.

a number of villages.
A small branch valley from rt. with very gravelly stream bed.
- Bludenz - spectacular aiguilles on mt. to left.
Peaks with snow to rt.
R. climbs a narrow valley. Very steep high slope on rt. has a mixture of beech and spruce; after a slight turn to rt., it changes to almost pure spruce.
The other slope is gentle at bas, with meadows, debris cones, very steep, above this, with meadows and mixed spruce + beech woods, and above this towering cliffs and peaks of almost bare rock. Several fine waterfalls.
On rt. the steep spruce-covered slope is cut by numerous nearly vertical ravines with bare rocky beds. Debris cones at bottoms.
Becomes rockier and more precipitous. Some small but very high waterfalls.
Forest mostly on debris cones at foot of cliffs.
RR. goes along a series of such cones on left of valley.

Valley widens and slopes become more moderate.
Palaas.
Mosaic of woods and meadow.
Mostly spruce with some beech on rt., more spruce on left.
Crossed a terrific canyon entering from left.
Striking wildflower displays on unknown bits of meadow.
Salvia, Orchis, Ranunculus, Onosis, Centaurea, etc.
Climbing all the time.
Snow peaks on rt.
rather long tunnel.
Fine spruce forest across valley on rt.
Small village of Klösterle on flat bottom below it.
Hay drying on slopes and on flat bottom. ~~rel.~~ long tunnel.

Open spruce forest on rt.
~~very~~ long tunnel. emerge at
- Stanton am Arlberg
Valley with grassy lower slopes, coniferous forest above. considerable larch with spruce. Higher slopes bare, grassy ~~and~~ with snow patches.
Stream now flowing east.
Beautiful high country here.
Bare peaks with patches of heath and of snow. Small

1966 Austria.

cirques with snow accumulation.
On valley floor hay in curious little cylindric-vertical shocks.
Left slope very steep, rocky, with mostly Pinus sylvestris.
Rt with spruce + larch, less rocky.
High peaks on left very rugged, on rt. less so but now snowy.
Valley winds
Considerable birch mixed with the conifers.
Strengen
Valley broader, V shaped rather than U shaped.
Mosaic of meadow + forest.
Then valley mostly wooded, spruce or pine or mixtures, depending on slope.
Then mosaic of grass and wood on gentler slopes, with magnificent partly snowy rocky peaks to left. Valley now more U shaped.
Rocky steep slopes mostly pine covered, very scrubby above, on left. Some oak on rt. lower slopes, spruce above.
- Landeck.
slopes on left pine-covered, on rt. spruce-covered, some larch, some birch. A few Austrian

pine in valley bottom.
Pine forest on rock slopes to left scrubby and open.
Much birch, willow and other broad-leafed forest in valley bottom, which is now rather narrow.
River is now rather wide, flows through almost a gorge in places. Mixed larch and spruce on rt. cliffs on left with sparse scrub pine.
Valley winds now.
General pattern here seems to be pine - sparse to dense, on south-facing slopes, and spruce with larch on north-facing slopes, broad-leaf forest on flat bottom, esp. near river. Meadow here and there on either slope, where gentle enough, and larger areas on valley floor.
River rather silty.
Then some orchards, a village, and wide pine forests in valley bottom.
Bare cliffs on left and gravelly alluvial fans at base.
Pine forests are on dissected alluvial fans. Valley very wide here.
Large talus slopes on left.
- Ötztal small lumber mill.

throughout region, when there are meadows, they tend to be dotted with small wooden buildings - prob. barns for storing hay.

Valley has wide flat bot. left slope (or side) very rocky + steep, rt. more gentle - meadow + spruce - larch forests.

Becomes much wider, with spectacular mts. on left. Flat bottom cult. + hay. Left slopes still pine-covered, rt. spruce-larch.

Big peaks on both sides, those on left very rocky and bare above, with thick pine woods on lower slopes. Those on rt. greener but still bare near summits.

Bottom wide, flat, cult. Pine forest on slopes to left now very thick. Spruce on rt. with vertical strips of meadows - avalanche-paths?

Villages frequent.

Rounded bare-topped peak to left, very jagged one to rt.

Valley widens considerably. River is quite big here. Rugged high range to left.

— Innsbruck

Left about 1:05 p.m.

Valley below Innsbruck is wide. Mts on both are high, rugged, bare, rocky, a little snow.

Truck garden cultivation in flat parts of valley floor, pasture on rolling or hilly parts, with some forest. Mosaic of meadow with forest on lower slopes to rt.

Several small towns in valley bottom. Dense, tall pine forest on lower slopes to left. Broad-leaf thickets along river. Oak woods on lowest slopes to left.

Valley becomes rather hilly. Hilly parts are a mosaic of wood and meadow, meadow tending to be on gentler slopes. Mts here are high but not so much so as farther back. Tops are mostly bare. Some rugged ones in distance to rt.

Some bare cliffs on left. Forest on left still mostly pine, on rt. spruce above, mixed with hardwoods below.

— Jenbach

1964 Austria

Mts. become somewhat more rugged. Good cliffs on rt.
Bald rocky mts. on left.
Ruins of a castle on rt.
Valley narrows somewhat.
Towns & villages common along valley flor.
Larch-spruce forest on slopes to rt. Mixed spruce and broadleaf forest on lowest slopes on left.
Kundl
Mts on rt. become steep and rocky.
Bald rocky mts. in distance on left. On rt. rounded and wooded.
Wangl.
Beyond Wangl r. branches to rt. from Inn Valley up a small tributary, bet. beautiful wooded low mts. Mixed spruce & various broadleaf trees. Then pure spruce on rt.
Valley winds upward, and r. leaves it, up a slight side valley. Mosaic of grass and forest (mixed).
Climbs sides of this in great curves. Patches of fine spruce forest in meadowland. Low broadleaf trees around edges of spruce.

Mosaic of spruce and grass to tops of mts., here not very high or rugged.
Piles of short, peeled logs in several places — pulpwood?
Slopes becoming steeper and more wooded. Then gentler and more grassy. Hay and pasture in flat bottom.
Valley broadens out. A spectacular cock's comb-like ridge of aiguilles to left.
Large, crowded campground in meadow. A pond with hundreds of people swimming or lying on shores.
Rr. going down hill now.
Small city with a diversity of church spires. Rr. makes a loop around it.
Kitzbuhel
r. goes down a small valley from here. This becomes wide and mostly grassy at foot of cockscomb-like range noted above.
St. Johann.
Broad flat valley bottom. Slopes a mosaic of forest and meadow.
Valley becomes hilly, partly wooded with spruce.
Mts on sides rather rocky.

1966 Austria.

Some beech forest locally on hills - in valley. Hilly valley. Partly wooded for some distance.

Mts in distance becoming more rugged, some snow patches. r. is climbing. Fine bare rugged peak to left.

Hochfilzen

U shaped valley - rocky bare range on left, gentler wooded mts. on rt. ~~r.~~ going down-hill. Peaks to left are spectacular

Middle slope apparently covered by a dark scrub - Pinus mugo?

Lower slopes by mixed conifer forest & grass.

Striking towers and aiguilles on range to left.

Some of slopes along ~~rt~~ seem to have a mixture of grass and Calluna.

Rugged range on ~~rt~~ left and gentler forested one on rt. continues for some time.

Great snow peaks ahead down the valley.

Saalfelden

Turned away from the rugged bare range on left. Both sides wooded with

conifers to tops, some meadows. Flat valley bottoms in grass or cult. Considerable grade down-hill. Some very heavily grazed slopes to rt.

A lake on left, surrounded by rather steep wooded and grassy slopes.

r skirts shore for some distance.

Zell am See

Below lake the valley is wide and flat. The great snow peaks are at its right.

Logging here seems to be by clear cutting of rather small blocks.

r goes down a ~~rt~~ small valley, with larch - spruce woods and meadows on the moderately sloping sides. Stream lined with Alnus.

Small sawmills scattered in this part of the country.

Mixed forest in valley bottom, which is narrow, V-shaped. Spruce above, changing to spruce - birch.

Lend

Valley bottom has deciduous woods and thickets, with meadows.

Valley widens out and becomes U-shaped, but terraced. Spruce forest + mixed spruce-larch-birch, with meadows on gentler slopes.

Schwandbach - St. Veit

Steep but rather moderate mts. on both sides, wooded to tops, but with many meadows. Woods show signs of much cutting + regeneration.

Valley bottom rather narrow but flat.

a rather larger saw-mill.

Slopes ~~Hills~~ more grassy than wooded on both sides.

Alders along river-banks.

Much beech in forest on lower slopes. Mixed locally with Tilia, Carpinus, Betula, Acer, etc.

A striking rugged bare range of peaks off to left. (left is west, here).

Sambucus nigra common in thickets.

Bischofshofen

Crossed a fair sized river, then turned to follow it.

A rugged bare range of peaks on rt.

Also on left on distance.

many aiguilles + domes on rt. upper part bare, then a dark scrub belt. Then spruce and spruce-larch forest down to fairly low alts. where the beech and mixed broadleaf types become dominant just above the valley floor and on ~~the~~ cliffs of river ravine.

On a rather western very rocky steep exposure Pinus sylvestris is dominant, to rt. Opposite, less steep, spruce with some broadleaf trees, locally mostly beech.

Valley becomes gorge-like, walls rather bare.

Tunnel, emerge into a broader valley (perhaps same one). Flat bottom, terraced. Very steep mt. on left, small one on rt. Some snow on those on left. Willow + alder thickets ~~on~~ along river.

Flat land cult. + in grass.

Very large saw-mill.

Partly wooded slopes on both sides.

Mts. rather low.

Mixed woods on valley floor for a short way. Then broad and terraced.

High range to left,
low, wooded to rt. apparently
mixed conifers + beech.
Valley suddenly widens
much more. Extensive
poplar plantations on
flat land. r. going north.
A sharp pyramidal
peak in distance to left in
plain.
Low mts. to rt. thickly
wooded with beech with
some conifers.
Salzburg - Agen.
- Salzburg.
Hilly densely wooded
area, at least along r.
Some meadows in low
flat places.
Then it opens up some.
Apparently gravel
flats or moraines rather
dissected.
r. still going north.
Wide rolling plain
with a small lake.
r. turns east around
lake. Large area of
Phragmites growing in
water on one side of lake.
but winds a bit. General
direction still north.
Plain is a mosaic of
patches of wood in a matrix

of grass and cultivation.
Woods are mostly spruce.
Low mts. in distance on
both sides. r. has
gradually turned till
it is going east or nearly so,
then north again, then east.
Strasswalchen.
Plain is dotted with
small villages. Some
patches of woods are mixed
deciduous. Quercus fairly common.
Forest becomes less, except
in distance to north, also to
south. Then considerable
area of shrub along r.
Then a wide gently
rolling landscape
with little wood. Then
more hilly and fairly open
more woods. Willow
thickets along small streams
in open country. Woods,
planted spruce. Mosaic,
predominantly meadow.
Small sawmill. Low hills
mostly wooded.
Country along a small
stream mostly wooded
except a strip of meadow
and cultivation along both
sides of stream.
Then more open land.
Wooded low hills to right.

1966 Austria

Tall spruce plantation along rt. side of r.
Small city.
Rolling country, partly wooded. Gravel hills.
Small city.
More rolling partly wooded partly cultivated and grassy country.
More and more wooded.
Sawmill.
Attang - Puchheim
Flat cultivated plain
Forest in distance on rt, closer on left. r. going north or northeast. Plain seems bordered by low terraces.
City with much industry.
Landscape a serie of low terraces, mostly cultivated. Grain, sugar beet, etc. hay.
Plain now very extensive, esp. to rt. a bit low hilly to left.
Mostly open a with scattered trees. Rows of young Populus.
Small city on rt. Fairly large river on rt.
Some patches of wood on plain, mostly cult.
Sawmill + other industry.
Large gravel pit.
Outskirts of a city.
Wels

Continued extensive flat land. Some forests or plantations of Pinus sylvestris.
Mostly cult. and houses.
Orchards, meadows.
Patches of wood few, mostly broad-leafed.
Thickets along watercourses, but there few.
Very low rolling hills with some wood in distance rt. + left. r. going n.e.
sugar beets, potatoes, grain, a little alfalfa.
Plain becomes rolling, but not much forest.
Linz
Crossed a large river.
Flat cultivated and suburban country, wooded hills in distance both sides. Lake on right.
Houses much fewer. Some thickets and clumps of trees
Low woods, Salix?, to left a few hundred m.
Some grain being harvested.
Crossed a small river.
Woods in distance both sides. Some close on left.
Patches of mixed broadleaf, some Quercus.
Broad very flat grain fields
Some other things.

1966 Austria

- St. Valentin
Low hilly land on left, flat on rt. Mostly cult.
a patch of Vicia faba.
Patches of wood on hilltops.
Scattered trees and hedgerows, thickets along watercourses.
Rolling hilly land on both sides, thickets along watercourses. Mostly cult.
Haag
Oak thickets. Cult. land.
Hedgerows. Wooded watercourses.
Meadows.
Flat cult. valley with rolling hills on both sides
Wooded watercourses with Salix.
Patches of wood - planted spruce on slopes.
Follow the small valley for a good distance. As it widens out there seem to be more woods. Pine, Spruce.
Broadleaf thickets. Beech woods.
Small stream on rt.
Small city.
Broad flat valley, mostly cult.
Low hills on both sides,
Partly wooded.
More Vicia faba.
Danube River very impressive
Cult. almost to banks
Plantation of seedling poplars for a few m. on bank,

River about 100-200 m. wide.
Wooded bluffs on other side.
Then a strip of mixed woods a few m. wide on this side.
Low swampy land with Salix.
Pöchlarn
Near Melk the Danube has a braided course, with Salix forest on banks and islands.
At Melk is a huge old structure, probably a monastery.
From here on leaves river and goes through gently rolling cultivated country, with some patches of woods on low hills.

1964 Austria

July 5 - Vienna

The range of hills surrounding the west side of the city has been protected, legally, for over a hundred years, as a green belt. It is wooded, but the woods are strictly managed. Predominantly quercus, with locally areas of pure Fagus. In oak forest understory may be Acer campestre. Areas of Pinus nigra are angular, obviously planted. Some Fraxinus, Tilia. Around edges Acer campestre, Crataegus spp., Ulmus sp., Corylus avellana. Mixed in here and there a few Pinus sylvestris, Ailanthus altissima, neither apparently doing very well. A large wide-spreading tree of Robinia pseudo-acacia more or less in the open. Very little undergrowth, but this may be because the Austrian foresters like clean forests. Not even much herbaceous ground layer. Some Galeopsis (?) and Asperula.

On the south facing slopes toward Vienna

are vineyards, very little else. These, though privately owned, are a part of the green belt. The purpose of this green belt is to provide fresh air for the city. Building is strictly prohibited, though there are a couple of restaurants around historic buildings, as one put up by Prince Leopold to celebrate his victory over the Turks. He gave the green belt to the city. The green belt, as well as the large city parks (also to provide fresh air) are strongly supported by the people - though now they are not much used for walking since cars have become common.

The vegetation is said to change markedly southward in this range of hill.

The grain in the vicinity of Vienna is either being harvested, ready to harvest, or almost so.

1966 Austria - Switzerland

July 6 - air trip Vienna - Zurich - Geneva.
dep. Vienna 6:30. arr. Geneva 9:30

nos. checked

Labels typed

1966 France

July 9 - crest of Haute-Savoie
~~La~~ grand Salève,
mountain south of Geneva
in soil derived from limestone

near les Rochers de Faverges — 1260 m.

	47937	Campanula persicifolia very local in grassy meadow partly shaded	flowers blue-violet
X 2	38	Brachypodium common in meadows	leaves yellowish green
X 2	39	Koeleria cristata local in semi-shade along road	
X 2	40	Alopecurus occasional in meadow	
X 2	41	Alopecurus roadside	
X 2	42	Satureja roadcut	fls. violet, palate white, marked with maroon
X 2	43	Campanula rotundifolia road cut	
X 2	44	Campanula common in meadow	flowers deep purple
X 2	45	Campanula rotundifolia common in meadow	
X 2	46	Campanula glomerata common in meadow	flowers violet.
X 2	47	Gentiana common in meadow	flowers violet
X 2	48	Dianthus common in meadow	flowers bright crimson-pink

around head of la Grande Gorge — 1700 m

X 2	49	Galium verum L. common in meadows	flowers bright yellow.

nos checked
118 labels typed

1964 France

79
~~47~~ 50 Thesium
X 2 common locally in meadow
X 2 51 Aspenula glauca
~~to~~ occasional in meadow
X 2 52 Dianthus
common on ledges.
X 2 53 Arnelanchier
common on ledges
X 3 54 Arctostaphylos uva-ursi L.
common on ledges

Aire

July 10 - near Col de Lac, Jura Mts.
about 20 km. w. of Geneva
on soil derived from limestone
X 2 55 Veronica
common in disturbed forest
X 2 56 Galium odoratum
common in disturbed forest
X 2 57 Galium cruciatum L.
very local ~~on open~~ among
limestone outcroppings in meadow
on open crest of ridge.
X 2 58 Phegopteris dryopteris
very local in beech-spruce forest
X 2 59 Lonicera alpina
rare in small openings
in mixed beech-spruce forest
X 2 60 Galium odoratum
common in small openings
and along trails in forest
X 1 61 Geum rivale
rare in small openings in
forest.

(To p. 122)

yellowish green

~~fs~~ corolla tube pinkish in
bud, flowers white.
— corolla bright pink,
calyx dull maroon.
— shrub 1.5 m. tall,
fruits black when ripe.
— trailing mats,
leaves glossy; fruit
immature.

1750 m flowers lavender

" stems erect

1370 m stems erect, leaves yellowish
green, conspicuously reflexed,
flowers yellow.

1300 m

" shrub, m. tall, leaves
glossy beneath, flowers
— bronze-yellowish to red.
" stems erect, flowers white

sepals maroon, petals
whitish turning reddish
bronze.

1966 France

July 10 Lac Pass,
Jura Mts

Road ascends from the village of Fangez, first through open land then thickets and irregular brush, then at about 600 m into forest, largely beech and other deciduous trees, some Picea. This forest is clearly regularly logged, and along some branch roads logs are piled. Some areas have been cut over, leaving only a very open stand of saplings of beech, ash, etc. There is much sprouting from the stumps, which are cut close to the ground.

The flora along the road is, of course, much richer and different than that in the forest.

The surfaced road switch-backs up the mountain, branching several times, but main road reaching its highest point at about 1250 m below the Col de Lac.

The forest along the upper part of the road is mainly beech and spruce,

1370 m with occasional fir. From the end of the road a path goes up a shallow ravine through the forest. Considerably more species seem to occur along the path than in the forest. After the slope becomes gentle the path follows a contour, perhaps climbing slightly, to the left. Very soon it widens into a long narrow meadow, now wider, now narrow, with abundant Geranium sylvaticum and other conspicuous flowers. The forest is clearly invading these meadows. Said to be formerly pastures, now very few cows on them. Tall dense grass and other herbs. Partly shaded. Limestone boulders and outcrops.

Finally just above the Col de Lac the landscape generally is meadow with limestone boulders. Gentiana lutea is very common, also Thymus sp. and Satureja in rock crevice. Quite an abundant and varied meadow flora.

nos. checked
Labels typed

1966 France

47962 Galium pumilum
X 2 common in small openings
and meadows

X 3 63 Satureja
among limestone outcropping
and boulders on the summit ridge

1370 m. stems erect, flowers white

" flowers bright purple;
plant strongly aromatic
when broken.

1966 Virginia

July Relay Station on ridge of Bull Run Mts.
crest of ridge is a quartzite outcrop
low scrub of Gaylussacia baccata between rocks
a few Kalmia latifolia.
Mature sprouts of Castanea dentata with young fruits. Acer rubrum, Paulownia, Nyssa, Pinus pungens.
These all large shrubs. Surrounded by Quercus prinus; some Populus grandidentata.

Willis House in inter-mountain valley —
quartzite ridge with almost pure Quercus prinus, Vaccinium etc. forest on slope more mixed.

Valley bottom with small brook with an area of moist bottom-land. Rich herbaceous flora — Orchis, Lymphocarpus, Circaea, Thalictrum, Arisaema, Desmodium, Athyrium, Galium, Smilacina, Carex spp, Amphicarpa, Apios, anemone

Nothing in rocky stream bed, itself.
Good diverse shrub layer. Alnus.

Rolland, old place on the west slope of the ~~Blue Ridge~~ Bull Run Mts. — above the house, stables, etc.
At foot of Mts. a large area of second-growth forest — mixed oaks, tulip, Pinus ~~echi~~ rigida, locust, ash, persimmon, hickory, Morus rubra, Sassafras, Nyssa.
irregular, 30% canopy.
a prominent secondary layer of Cornus florida with some Cercis.

Shrub layer
Lindera

Rather diverse herb layer
c Parthenocissus
a Desmodium nudiflorum
Polystichum
c Circaea
c Rhus toxicodendron
a Apios

Virginia

Each subordinate layer largely composed of young plant of higher layers

As slope increases more and more large boulders show at surface. Forest does not change much.

1966
July 24 - S.W. slope Bull Run Mts., above Roland
in dense second-growth deciduous forest

Fauquier County

47964		leg. very local among sandstone boulders		twiner, flowers magenta.
x 5	65	Circaea quadrisulcata var. canadensis (L.) forming a large colony many meters across	Hara	terrestrial - bearing rhizomes white, slender, branched; petals white.
x 4	66	Ceanothus americana occasional along an old trail		suffrutescent herb or sub-shrub, fruit glab. erect, flowers deep yellow.
x 5	67	Agrimonia common along old trail		
x 4	68	common along old trail		
x 1	69	Phryma leptostachya L. rare along old trail		flowers pinkish.
x 2	70	Carex rare along old trail		small tufts
x 2	71	Uvularia perfoliata abundant		
x 2	72	Circaea quadrisulcata var. canadensis local	(L.) Hara	flowers white.

nos. checked
128
labels typed

1964 Virginia

47973 Galium latifolium Michx. ~~multiflorum~~
8 common on slopes
2 74 Conopholis americana (L.) Wallr.
very local, near
oak tree and Liriodendron.

nog. checked
Labels typed

1966 Virginia

July 31 - just south of Elk Wallow along Appalachian Trail in second-growth deciduous forest on very rocky west slope.

47975		Galium triflorum Michx. common	prostrate, roots yellow.
3	76	Stellaria ovata var. uvigera (Wood) Fern. rare, only a small colony seen.	erect, filiform white stolons abundant.
5	77	Galium circaezans Michx. common	stems ascending to erect.
4	78	Parnassia canadensis locally abundant, on patches of bare soil	
3	79	Agrostis ~~perennans~~ rare, along trail	tufts, culms ascending.
2	80	Carex alopecoidea Tuckerm. ? rare, along trail	culms spreading.
2	81	Amphicarpa bracteata (L.) Fern. locally abundant	sterile twiner
8	82	Dennstaedtia punctilobula common to abundant	rhizome buried.

Aug. 1 - Elk Wallow Shelter in thick woods along trail

6	83	Bromus cf. purgans locally common	culms strongly ascending panicles with branches drooping.

Aug. 1 - Big Meadows Picnic Ground under trees

2	84	Agrostis alba L. common	culms decumbent, spreading from root crown.

Aug. 1 - Crescent Rocks
Paths are much overgrown. No Potentilla nor Saxifraga seen. Hedyotis abundant, also Poa. Deschampsia. Physocarpus and Crataegus are abundant. Most of the Abies in more exposed places are dead, some of the more sheltered ones still healthy-looking. Asclepias syriacus in very good flower.

Aug. 1 - east of Riprap Overlook, headw. of large flat area and steep slope, covered by rather thin frost. Soil thin, very rocky. Mostly Quercus prinus, but some Q. alba, Acer pennsylvanicum, ~~etc~~ Q. coccinea (?) or Q. velutina (?), Betula lenta, with a variable ericaceous shrub layer, up to 3 m. or more tall. Rhododendron catawbiense common locally, Kalmia more general. Menziesia also. Rhododendron (Azalea) sp. generally common. An almost continuous dwarf-shrub layer of

Vaccinium vacillans, V. angustifolium, etc., Gaultheria abundant. Gaylussacia very local.
One area of several acres has Betula papyrifera common & abundant - dozens of trees, mostly several- to many stemmed from base. Searched here for Cornus canadensis but did not find it.

Labels typed

Aug. 1 - above headw. of Big Branch, 0.5 km. e. of Riprap Overlook — 760 m, 2500'
in rather thin woods, largely Quercus prinus, ~~with~~ or very rocky thin soil. on north slope

47985 Betula papyrifera var. cordifolia (Regel) Fern. — many trunks from base, 8 m. tall, white
x5 very common in very limited area — sterile dwarf plants only, seen.

x1 86 Viburnum under white birches

x1 87 Hedyotis purpurea var. tenuifolia occasional

x2 88 Vaccinium angustifolium common in dwarf-shrub layer — 1-2 dm. tall, leaves dark, semi-pellucid, sterile.

x2 89 Vaccinium vacillans abundant in dwarf-shrub layer — 2-4 dm. tall, berries blue.

x2 90 Gaultheria procumbens abundant in dwarf-shrub layer — about 1 dm tall or less, flowers white

x2 91 Vaccinium vacillans abundant in dwarf-shrub layer — 2-4 dm. tall; berries blue.

x2 92 Vaccinium — 1-3 dm. tall, leaves green on both sides, pellucid-veined.

x4 93 Rhododendron catawbiense scattered locally. ~~on north slope~~ — shrub 3 m. tall.

Aug. 1 - Crescent Rocks top of sandstone cliffs

x2 94 Poa very common in open ~~in~~ crevices

x2 95 Agastache nepetoides (L.) O. Ktze. rare in thicket — erect, 0.8 m. tall.

x1 96 Polygonum convolvulus L. common in open in crevices — twining.

not checked

Labels typed

1966 Virginia

Aug. 2 - Lands Run Falls
1½ mi. w. of Compton Gap.
on ledges of rock cliffs

~~1850'~~
300 m

47997 Betula
x 3 one or two plants

sapling 3 m. tall, 2 cm thick, bark bright chestnut, peeling in thin rolls.

x3 98 Muhlenbergia sp. sobolifera
very local

culms erect

x1 99 Woodsia obtusa (Spreng.) Torr.
rare

fronds wilted, dried up when collected.

Aug. 2 - Lands Run, just inside Park boundary.
narrow flat bottom of ravine along stream

400 m

48000 Verbena urticifolia L.
x2 occasional

erect; flowers white.

x5 01 Boehmeria cylindrica
common on rocks in stream

a number of stems from base.

x4 02 Laportea canadensis
very common

erect stinging herb, flowers greenish.

x3 03 Galium asprellum
occasional

weak, procumbent.

x2 04 Agrimonia rostellata Wallr.?
rare

erect; flowers yellow.

x4 05 (grass)
common

erect, very small tufts.

x3 06 Leonurus cardiaca L.
common

erect, somewhat aromatic when broken.

x1 07 Hackelia virginiana (L.) Jtn.
rare

flowers white.

x1 08 Phryma leptostachya L.
occasional

x2 09 Cryptotaenia canadensis (L.) DC.
common

nos. checked
labels typed

1966 Virginia

48010 Lindera benzoin (L.) Bl.
common

11 Polymnia canadensis L.
common

12 Actinomeris alternifolia (L.) DC.
rare

Aug. 2 - north entrance to Park just south of Front Royal
in thickets at edge of woods

13 Gymnocladus dioica (L.) Koch
small colony of young trees

aromatic shrub 2 m. tall,
- fruit green, turning red.
erect, flowers very pale
- yellowish.
sterile.

210 m

sterile shoot 3 m. tall;
leaves glaucous beneath.