

RECORD



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Collection and Field Note Book

No. 79

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

(47772 - 48013)

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Book # 79  
begin # 47722  
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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 crinitipes

blade <sup>lower</sup> primary veins & midrib white  
Leaf 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.

BCI

70°-72° - 80°-89°

annual prec. 30-90"

3-4 mo. Jan-April &lt; 10"

Oct-Dec. (at w.) rainiest season.

Geophila repens

BCI. Shalluck 130 Harry 286

Herb. BCI

3 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 ~~Island~~ Iselin  
better invite to sea level canal conf.

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



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 *Cucatella* - *Byrsonima* savanna.

4 photos Kod. & 16 mm across El Valle. showing semi-denuded hills.

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

### Ris Hats

both rock and sand shoes 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* & *Cucatella* very common. In places open, even open enough to be called savanna.



2-3 mi. e. of Bajoco  
Crane Bay. Large  
mangrove swamp extending  
~~at~~ 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.



Labels typed

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

47772

Helicteres

\*2

common in weedy scrub

May 10 - Barro Colorado Island

\*1

73

Eleusine indica (L.) Gaertn. in paths around station

\*3

74

Olyra

in path in dense old second-growth forest

shrub ~~1.5~~<sup>2</sup> m. tall, flowers red.

firmly rooted tufts (said by Mr. Chadwick to be a great pest)

tufted, erect or ascending.



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

Allbrook site - forest  
Chivachua site - cleared

Data base inf. unclassified and available.

No program for training of  
help.

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<sup>m</sup> platforms & 45° ladders.

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

site is 100' above sea level.

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

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

Geophila repen

Ft Sherman 1 spec. Blum 1458

old Fort San Diego 1 spec 2207



Herbarium has metal  
tripe 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. Naia 9.

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

A little work has been done  
on physical oceanography  
by Internam. 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.



Small Island near  
Smithsonian Lab & Nike site.

Covered by a tangled scrub  
of *Bursera*, *Hyllocereus*,  
various shrubs & vines  
with scattered trees  
*Hippomane mancinella*  
*Bursera simarouba*  
*Ficus*  
*Chrysobalanus icaco*  
*Tecoma stans*  
*Peperomia* sp.  
*Lapinum*

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

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

General course 20 people  
(2 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.



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 plantation around S.J. Open grassland on hills and in valleys along course, with patches of poor woods, and thin wooded ravine. Small orchards & coffee at foot of mts. Mts mostly grassy with hedgerows, small coffee & banana plantations, small crop fields, wooded ravine, 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 on it. Coastal plain fairly wide, broken by range of low hills.

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

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

Mts. continuously forested, scattered white tree, 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 plantation, large oil palm plantation. 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 sizable valley system near end of coastal plain.

Coast now alternately sandy & rocky. Mts. still partly







largest are Carapa  
shrub layer 2-3 m.  
conspicuous but not  
difficult to penetrate  
than ground layer.  
Cyclanthaceae in shrub  
layer. many seedlings  
of trees. *Homalomena*. *A. rooseae* (palm)

Palms abundant in  
under story, mostly fan  
palms. *Chrysophyllum* to 10 m.

Most trees well-butressed  
Locally trees may be  
only a few m apart.

Almost no ferns on ground  
a few on bases of trees, mostly  
*Andropogon*-like.

*Strobilium moribundum* -  
large forest tree.

*Xylocarpus* has branched  
thorns.

*Ochroma*, *Calathra*, *Cecropia*  
in open along rd.

*Puberodendron* on ridge top  
leafless. lvs. beginning to come  
out. very high buttresses.

Ridge site Rigo R. <sup>100+ m</sup> 21  
about 4 km. Rincon Bay

A site on a ridge has  
very tall forest in many  
respects similar to that  
at Venagas. Vines not  
abundant. Undergrowth  
rather thick. Laying  
indistinct.

*Zamia* common.

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.

*Caryocarpus* has no  
buttresses, cylindrical trunks,  
large, lvs. trifoliate,  
opposite, stipule calyptate,  
caducous.

Top of ridges flat, narrow.



May 15 just west of Rincon  
Swamp. Tidal  
Mora upstream  
mangrove down.

Thicket of a slender  
spiny *Bactris* with a large  
dark purple edible fruit  
(pulp thin, fibrous but  
pleasantly acid). Tangles  
of a shrubby bignon. *Enallagma*  
with large calabash-like  
fruits. <sup>There</sup> thickets of  
a *Randia* (sterile) and a  
bare bignon with white  
flowers. Mora still present.  
Then a mixture of tall  
*Rhizophora* with some large  
*Avicennia*. Trees of both to  
20-30 m. Most of *Rhizophora*  
have prop roots emerging up to  
2 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,  
roundel crowns, canopy  
complete to perhaps 75%.  
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 Baujo + 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 <sup>west</sup> of San Jose  
are denuded and beginning to  
show signs of accelerated erosion.



Labels typed

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

in mangrove swamp at mouth of river

47775 Ficus occasional in undergrowth

44 76 Ardisia very common in undergrowth

43 77 Aricennia occasional

42 78 Acrostichum aureum L. abundant, especially in open areas

43 79 (bignon.) Tabebuia palustris Hemsl. det. A. Gentry 1974 local in undergrowth in open-forest part of

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

X with W.H. Hatheway 80 22

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

48 81 fern Trichomanes diversifrons (Bory) Mett. common on flat ridge top det. Killinger 1978

42 82 (annon.) one tree seen +1

tangled large shrub or small tree

tangled shrub, ripe fruit fleshy, black.

large tree, 20 m. tall, flowers pale buff.

leaves pale beneath veins visible above.

rhizome short, erect, fronds erect, young ones reddish green.

tangled shrub, mound-like, mostly leafless; corolla white, throat rather flattened.

slender erect shrub with single main stem, 4-5 m. tall; corolla white.

rhizomes and fertile fronds erect.

slender understory tree, flowers green, stamens cream.



Label typed 26

1966 Costa Rica

- x 7 47783 Psychotria on flat ridge top
- x 7 84 Duroia on flat ridge top
- x 3 85 Laurauja rare on flat ridge top

~~Vanegas~~  
May 15 Vanegas River

in tall ~~dry~~ primary tropical wet forest on very flat ~~so~~ heavy clay soil

- x 17 86 Randia +8, +8, 1

May 16 - headw. of Rio Siquines, below Alto de Guayacán, east of Turrialba in thick disturbed Tropical Wet forest, ~~with~~ dense undergrowth

- x 12 87 Cephaelis +5, +5 ~~soft~~ very common
- x 6 88 Psychotria common
- x 4 89 Psychotria Rudgea cornifolia (H. + B.) Standley occasional det. W.C. Burger 1992
- x 5 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.



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

predet. R. amplexicaulis

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

To be completed by MO staff.

100 m

Accepted on Computer

Typed on Duplicates

Entered in Field Book

Recorded & Mounted in Sheet (or if)

shrub 3 m tall, pale greenish, low.

up to 3 m. tall.

soft, green-stemmed shrub, bracts rose-red, corolla white.  
 low shrub, up to 1 m tall, flowers white.  
 shrub, thickly branched, 2 m. tall, buds yellow, corolla 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: *Rudqea 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 M  
Sheet (or if



- 47783 Psychotria  
on flat ridge top
- 7 84 Duroia  
on flat ridge top
- 3 85 Laurauja  
rare on flat ridge top

88

~~Vanegas~~  
May 15 Vanegas River

100 m

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

- X17 86 Randia +8, +8, 1

May 16 - headw. of Rio Siquines,  
below Alto de Guayacan,  
east of Turrialba

750 m

in thick disturbed Tropical  
Wet forest, ~~with~~ dense  
undergrowth

- X12 87 Cephaelis +5, +5  
~~stop~~ very common

- X6 88 Psychotria  
common

- X4 89 Psychotria *Rudgea cornifolia* (H. & B.) Handley  
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.

slender shrub 3 m tall,  
flowers pale greenish,  
fruit yellow.

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



May 16 - forest at headw. of  
Rio Siquines, below Alto  
de Guayacán. 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 3 dm 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 joubertensis*.

Natural forest of *Cornus*  
*disciplina* and *Nectandra*  
& associates.

Above it about 1900 m  
the rather flat interfluvium  
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 - ~~near~~ lower  
montane wet (S.H.)  
is a dense rather irregular  
single tree layer, with  
a well developed shrub  
stratum about 2-4 m. tall  
of *Palicourea*, *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 & *Ericacea*.

2000 m. *Quercus* forest  
about 20-25 m tall,  
with rubicaceous shrub  
layer 2-5 m. tall, with  
considerable moss.  
Looks like forest on Chang Dao  
ridge above tea plantation  
in Thailand. Some spots  
almost bare of undergrowth.

This forest also has  
*Tournefortia*, *Myrsine*, *Rouphala*,  
*Guettarda*, *Magnolia*,  
*Aiouea*, *Alnus*, *Clusia*,  
*Prunus*, various *Melastome*  
and *Blakea*, ~~*Catpa*~~ *Caosteja* &  
*Miconia*.

*Tournefortia*, *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 roof  
conspicuously gabled, some  
up to 30-35, rarely more cm dbh  
spacing 1-4 m. Epiphytes  
~~very~~ abundant, trunks  
thinly but densely mossy.



Composition very mixed.  
~~the~~ *Drimys* common, one  
 tree easily 4 dm dbh & 25 m tall  
 some lianas - *Cyclanthus*.  
 a few *Arthurnums*.

One old *Persea americana*.  
 A few very large trees  
 here and there.

Rubiaceae, Melastomaceae,  
 etc. in undergrowth.

Photos of *Cornus*-*Pavonia*  
 forest 1 by 3 Kod.  
 rounded clumpy dense  
 tops of trees *Cornus* light green.



with  
W.H. Hatheway  
& D. B. ~~Smith~~  
Nicolson

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

47791 (asclep.) +5, +5  
12

92 (celast.) Microtrichis

93 (ulmac.) (Pterocarya or yellow) +5, +5, 1  
rare, left in pasture

94 Symphlocos +5, +5  
occasional

95 Villaresia costaricensis (in Citronella c.)  
occasional +5, +4

96 (theac.) +4, +4  
occasional in pasture

97 Palicourea wood?  
occasional

98 Deppea  
common

99 Bidens  
common

47800 Mours insignis  
rare tree, left in pasture

woody twiner with  
white latex; corollas  
dirty pinkish white.  
~~small~~ tree.

tree 3dm dbh 20m tall,  
fruit green.

small tree; fruit  
green.

medium sized tree,  
flowers white, fruit  
fleshy, blue-black, glossy.  
small tree, 10m tall.

shrub under 1m tall  
inflorescence greenish yellow,  
corollas lemon-yellow.

slender shrubs 2-3m tall,  
flowers bright yellow (several individual  
in ~~the~~ collection).

scandent suffrutescent  
herb or shrub, scrambling  
in trees and pendent,  
several or many meters long,  
rays yellow, disk  
greenish yellow.

tree 20m tall, leaves  
very rugose; fruit red,  
pendent.



typed

- 47801 (rub.)  
single tree left in pasture
- 02 (theac.) *Rhacoma tonduzii* (?)  
occasional
- 03 *Linociera*  
rare at this elevation
- 04 *Hoffmannia steinortlii* Fock.  
very local, on banks of stream in dense forest.
- 05 *Hoffmannia*  
local ~~in forest~~ of stream in dense forest
- 06 (rub.?)  
one tree seen in opening near stream.
- 07 *Palicourea* +4 +4, 1  
occasional in forest
- 08 *Palicourea*  
fairly common in edges of forest
- 09 *Hoffmannia*  
rare in forest
- 10 *Palicourea*  
fairly common in forest and at edges of forest
- 11 *Cornus disciflora* +4, +4  
very common, one of dominant.
- 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.
- ~~shrub~~ 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 ~~is~~ yellow green, corolla lemon yellow.
- shrub 1 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



topped

X 47813

Palicourea

occasional in edges of forest

2

X 2 14

~~Didymaea~~ +1

common on base of tree in pasture

X 3 15

Viburnum

occasional

X 5 16

Palicourea

common in edges of forest

X 4 17

Palicourea angustifolia

occasional

same, oak forest

X 4 18

Guettarda poasana

edge of forest

X 5 19

Blakea

occasional in edge of forest

X 6 20

~~Guettarda~~ Roupala

occasional

glaberrima Pittier

same

X 7 21

Hoffmania steinvothii

very local in dense forest on bank of stream

X 2 22

?

very rare

X 6 23

Hoffmannia

very local on banks of stream in dense forest.

X 3 24

Cephaelis axillaris

occasional in dense forest

shrub less than 1 m. tall, thyrses yellow-green, flowers lemon yellow. creepers, fruits blue.

small tree, fruits black

shrub 3 m. tall; thyrses red; corolla orange.

shrub 3 m tall; thyrses reddish, corolla magenta.

2050 m

large tree; corollas purplish outside, lobes white, crisp; fruit black.

large vine on trunk of tree, petals white, fruit red.

small tree, flowers white.

2000 1975

shrub 1.5 m. tall, flowers dull orange. fruit globose, fleshy, reddish black. (holotype)

shrub less than 1 m. tall, sterile.

shrub 1.5 m. tall; flowers dull whitish; fruit immature.

green-stemmed low shrub, bracts dull purplish, corolla white.



✓ typed

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 <sup>low</sup> Montane  
Rain forest.

2100m

x12

28

Persea americana ?  
rare

x2

29

Hoffmannia  
rare

x1

30

Burmeisteria  
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 3m. tall. thyrses  
red, corolla orange-  
yellow.

large shrub; flowers  
white, lobes with crisped  
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~~  
thyrses red, flowers pale lavender.  
small shrub; sterile.

shrub 4 m tall; thyrses green,  
corolla yellow.

shrub 3 m tall, thyrses  
yellow-green, corolla yellow.  
herb 0.7 m. tall, corolla  
scarlet, lobes of ovary yellow.



47838

*Palicourea*  
occasional

Irazu

May 18. Volcan Irazu

in deep volcanic ash  
on crater rim

3200 m

with  
W.H. Hatheway  
& D.H. Nicolson

77

*Arctostaphylos*  
common

sprouting shrub,  
flowers cream white.

40

*Vaccinium*  
common

sprouting shrub, fls.  
cream white, berries blue.

41

*Lobelia laxiflora*  
very common on road cuts

2100 m

shrub up to 1 m. tall,  
sparsely branched,  
corolla scarlet.

May 18 Volcan Irazu  
along highway to summit

41a

*Cordia ruscifolia*  
common ~~found~~ in a very  
limited area along road cut

scrambling semi-scandent



May 18 - auto trip up Irazu V.

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

Trees in Cartago

*Araucaria excelsa*

*Cedrela* sp.

*Casuarina equisetifolia*

*Lalix chilensis*

*Pearcea americana*

*Tecoma stans*

*Schinus molle*

*Cupressus* "Guatemala Cypress"

*Roystonea oleracea*

*Phoenix canariensis*

Lower slopes above Cartago  
1500 - 2000 m grassy pastures and cult. patches separated by hedgerows and wooded ravines.  
Lower Montane Moist zone (S.H.)  
(1600 - 2300 m range acc. Hatheway)  
(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.

*Robelia laxiflora* on cut bank at about 2000 m. - 2150 m.

*Caixa* cf. *candamarcensis* at about 2200 m.

At 2350 m - 2500 m, + the oak-filled ravine seems still in good shape.

above ~~2350~~ Acristus lines road in places.

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

2600 m. oaks in ravine and scattered on slopes. Slopes grassy. ~~low~~ mostly *Pennisetum clandestinum*. Some cultivation.

2700 m alms and oaks, *Buddleja* scattered on grassy slopes. Horizontal ditches on fractured slopes are quite conspicuous. Constructed to stabilize slopes and prevent mud flows.

At 2840 m. *Criaria* lines road. *Escallonia* begins here. *Pennisetum* colonizes ash very well here. *Gunnera* in ravines.



Around toward east is an open forest to savanna of *Buddleja*, oaks, araliads. *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 945 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 points was is bare.

*Arctostaphylos* on rim is sprouting and flowering. *Vaccinium consanguineum* also flowering.

No colonization on rim but down just a little *Lupinus*, several grasses,

photos  
to be  
+ color  
outside  
shots  
and inside

*Rumex acetosella*, *Graphalium* 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. *Myrtilodendron* seems often epiphytic 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 m. down, in on  
road cut and embankment.  
*Stellaria pubera* fruiting -  
the fruiting branches procum-  
bent 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.

But Compton Gap & Jenkins  
a thin wooded flat with  
*Kalmia* and *Rhododendron*  
~~forming~~ forming a well  
marked 1-2 m shrub layer.  
*Rhododendron nudiflorum*  
but variable in flowering

2100'  
time and color - pale  
ones in full flower, pinker  
ones about over. Odd varies  
but no strong clove odor.

E. of Jenkins Gap on a  
gentle w. slope,  
colony of *R. roseum* in  
rather thin woods.  
~~varies~~ Varies somewhat  
in color, st. 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 m. 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. *diocum*.  
*Smilacina racemosa*.



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

47842 ~~Viola~~ Viola triloba Schreb.  
common

x 3  
x 2 43 Carex  
occasional

x 2 44 Carex  
occasional

x 1 45 Cerastium  
occasional

x 2 46 Geranium  
common

same - in thin oak forest  
on rocky ground

x 4 47 Lathyrus?  
locally common

x 3 48 Vicia  
locally common

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

x 4 49 Trifolium  
abundant in patches

x 1 50 Lagotis  
common

x 4 51 Lepidium  
abundant in patches on  
otherwise bare soil

petioles erect; flowers purple.

culms spreading to  
ascending.

plant caespitose,  
culms spreading.

plant weak; flowers white

stems spreading from  
slender root crown;  
flowers deep rose.

flowers magenta

flowers pale lavender.

flowers light yellow.

flower white

erect; flowers yellow.



nos. checked

52

1966 Virginia

labels typed

for Xerox

47852

Tragopogon

rare

X1

53

Oxalis

occasional

X1

X3

54

Crataegus

one tree seen

X1

55

Maclura pomifera

one tree seen

X1

56

Gleditsia triacanthos

one tree seen

same - on boulder talus  
below overlook

X3

57

Bromus

abundant

X5

58

Hesperis

one large patch

May 29 - Land's Run Gap  
in <sup>thin</sup> second-growth forest

X1

59

Barbarea vulgaris

one plant seen

X3

60

Barbarea vulgaris

common along road

May 29 Land's Run Fire Rd.

X3

61

grass

very common on fill along road

X3

62

Equisetum arvense

local on fill along road

Ⓞ

Shen. Nat. Park

53

erect, ligules yellow.

flowers bright yellow.

small ~~tree~~ closely  
branched tree; petals

white anthers dull purple.

small tree; bark dull

yellowish; sterile, leaves

not quite mature.

small scraggly

tree with branched

thorns on trunk.

spikelets drooping

flowers varying from

white to deep magenta

in same colony.

flowers pale yellow.

flowers bright yellow.

erect, small tufts.



nos. checked

54

typed for Xerox

47863

1966 Virginia

*Stellaria pubera*  
common on road cut  
and roadbed

May 29 - Land's Run Falls,  
on Land's Run Fire Rd. in

x1 64 *Carex*  
on rocks near stream

x1 65 *Barbarea*  
occasional in road

v2 66 *Galium aparine* L.  
occasional in weedy  
along road.

~~67~~  
May 29 - Skyline Drive  
between Compton Gap  
and Jenkins Gap  
in ericaceous shrub  
layer in thin oak forest

v2 67 *Rhododendron nudiflorum*  
common

~~x1 68 *Antennaria*~~

x1 68 *Antennaria*  
rare

v2 69 *Rhododendron nudiflorum* (L.) Torr.  
occasional

May 29 - Skyline Drive,  
milepost 14, bet. Jenkins Gap  
and Hogwallow Flat Overlook  
in scrubby forest on gentle  
west slope

Shenandoah Nat. Park 55

sterile shoots erect,  
fruiting ones procumbent.

dense forest

caespitose, culms  
strongly ascending,  
erect, flowers bright  
yellow.

weak, supported by  
weeds.

shrub 2 m. tall,  
corolla tube red, limb pale  
pink; odor not very good.

stem prostrate, scapes  
erect.

shrub 1.5 m. tall,  
flowers pink, tube red,  
odor not very good.



47870 Rhododendron roseum  
common

71 Maianthemum canadense  
very common

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 sh <sup>ests</sup>

73 Rubus idaeus L.  
occasional

74 Rubus  
very common

75 Sanguinaria canadensis  
abundant, rhizomes  
in crevices between rocks.

76 Potentilla simplex Michx.  
common locally

77 Arisaema triphyllum L.  
rare

78 Carex  
common on rock ledges

79 Arisaema atrorubens  
occasional

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, <sup>rooting at tips,</sup> 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, striped  
with white.



no. 58  
typed for record

1966 Virginia  
atrorubens

Shen. Nat. Park 59

47881 *Arisaema atrorubens*?  
occasional

leaves scarcely glaucous,  
but not quite clear green beneath;  
spathe purple, striped  
with white inside.

82 *Arisaema atrorubens*?  
occasional

leaves scarcely glaucous  
but not quite clear green  
beneath; spathe green.

83 *Carex*  
rare

945 m. small tufts, culms  
3100' spreading; slightly glaucous.  
large rather loose tufts,  
culms ascending.

84 *Carex*  
occasional  
85 *Ranunculus allegheniensis* Britt  
locally common  
~~locally common~~

petals yellow.

86 *Ranunculus abortivus* L.  
locally common

petals yellow

87 *Woodсия obtusa*?  
rare, at top of small clifflet.

88 *Viola palmata* L.  
rare

flowers purple, lower three  
petals white at base, lateral  
ones bearded, lower striate  
with black.

89 *Sibara virginica* (L.) Rollins  
rare

flowers white

90 (grass)  
rare

erect

same - in thin *Fraxinus*  
forest with some *Robinia*, on

very rocky ground

91 *Carex*  
along old road

loose tufts

92 *Carex*  
along old road

loose tufts

93 *Carex*  
in deep leaf mold

culms spreading,  
plant somewhat glaucous



47894 Viola  
common in old road

95 Viola triloba ~~Schub.~~ Schur.  
rare in old road

97 Rhododendron nudiflorum  
rare

96 Rhododendron roseum  
rare

98 Ranunculus bulbosus  
common in old road

99 Prunus virginiana  
occasional

47900 Sambucus racemosa  
rare in undergrowth

01 Viola rafinesquei  
very local at roadside

02 Veronica peregrina L.  
rare along old road

03 Senecio aurea  
common, especially along old road

04 Smilax herbacea  
rare

leaves erect; flowers purple,  
lateral petals <sup>bearded</sup> bearded at  
base, lower one striate with  
black or white at base.  
(possibly 2 species?)

leaves erect; fls. purple,  
petals white at base,  
lateral bearded, lower  
striate with black.

945  
3100'

shrub 2 m tall; corolla  
tube red, ~~lobes~~ very  
pale pink, ~~upper one~~ upper one  
very ~~slightly~~ slightly  
yellowish in center, spot  
at all clove scented, odor  
faintly unpleasant.

shrub 2 m tall, flowers  
bright pink, tube deeper,  
upper lobe with orange patch  
in center, clove scented.

flowers yellow, showy.

shrub 2.5 m tall.

shrub 2.5 m tall,  
fruit immature.

erect, flowers deep yellow.

erect, subglaucous



1962 Virginia

ctd. from p. 49.

*Cimicifuga*, *Aster*  
*macrophyllus* (a),  
*Sanguinaria* (o)  
*Galium aparine* (o)  
*Geranium perfoliatum* (l)  
*Hydrophyllum virginicum*  
 (c), *Clematis*, *Rhus*  
*toxicodendron*, *Dioscorea*  
*quaternata*

Understory of *Crataegus*  
 and *Hammamelis*, *Icthyga*.

Apparently there has  
 been a hard frost after  
 things began to grow  
 this spring. Many  
*Arnica* and other  
 herbs seem to have been  
 frozen back. *Carya* <sup>ostya</sup> buds  
 killed. Perhaps this  
 is the reason the oaks,  
*Robinia*, etc. show little  
 signs of leafing out yet.

Fire road trace, in  
 and immediately alongside  
*Ranunculus bulbosus*, *Cerastium*  
*viscosum* (?) *Taraxacum*,  
*Poa* spp., *Hieracium pratense*  
*lagina*, *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 telephoides*, *Spirea betulifolia*  
*Pyrus (arctica) (glab.)*  
*Pyrus americana*  
*Solidago roanensis* v. *monticola*  
*Maianthemum*  
*Quercus rubra*  
*Betula lenta*  
*Dennstaedtia punctilobula*  
*Carex* spp. ?  
*Menziesia pilosa*



64  
47905

1966 Virginia  
rare, near old road  
Poa  
common near old road  
Thalictrum dioicum  
very common  
Prunus serotina  
occasional

May 30 - south slope of High Top  
in thin second-growth  
oak woods

09 Veronica peregrina  
abundant along Appalachian Trail  
10 Tradescantia virginica  
occasional  
11 Tradescantia virginica  
occasional (with #47910)

May 30 - near summit of High Top  
on ledges on rock cliff

12 Carex  
small patch  
13 Carex  
a few tufts  
14 Menziesia pilosa

to p. 68

Shen. Nat. Park

65

erect

erect

mostly not yet flowering,  
roots yellow.

↑

small tree, petals white;  
twigs with very strong  
odor when broken.

erect; corolla blue, falling  
easily.

petals deep purple.  
(varying to paler and to  
dull or bright rose pinks),  
filaments with copious  
purple hair, anthers yellow.

petals deep rose pinks, (if varying  
to dull rose pink, light blue-purple  
and to deep purple), filaments  
with copious deep rose pink  
hair.

forming turf

small tufts

shrub (an. cal. corolla  
yellow with coral tips)



May 30 High 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.

Mouth of South River  
 Plover Ground, just s. of Baldface Mt  
 An old clearing <sup>Overlook</sup>  
 on w. side of drive - 3200'  
 filled with *Crataegus*  
*Rubus*, *Prunus*, etc.  
 a queer glandular  
*Rubus* is common.

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

*Botrychium virginianum*  
*Acer nigrum*  
*Quercus prinus*  
*Asimina triloba*  
*Parthenocissus quinquefolia*



not checked,  
68  
ready for Xerox

1966 Virginia

from 10.64

Carex

on shaded ledge

#

same - in scrubby oak forest

✓ 1 16

Zizia aptera (Gray) Fern.

~~very~~ common

✓ 1 17

Zizia aptera (Gray) Fern. forms

rare

✗ 1 18

Thaspium barbinode (Michx.) Nutt.

common

✗ 1 19

Cypripedium calceolus var. pubescens  
(Willd.) Cornell

rare

May 30 - 3/5 mi. s. of High Top

in scrubby oak forest

✗ 4 20

Pyrus malus L.

occasional

May 30 - Smith-Road gap.

in grassy opening

+ 7 21

Crataegus

occasional

May 30 - 1 mile n. of South River

Picnic grounds

old clearing now

choked with Rubus and Crataegus

✗ 4 22

Rubus rarus Bailey?

locally abundant

✗ 3 23

Crataegus

locally abundant

Shen. Nat. Park

69

small tufts

flowers clear yellow.

flowers rusty yellow.

flowers pale yellow.

perianth segments bronze.  
lip yellow.

small tree, fruit immature.

shrub 2 m. tall;  
petals white; anthers dull pink.

cane, stout, erect, to 2 m  
tall, slightly arching  
at tips.

shrub 4 m. tall, flower white, anthers  
purple.



not checked  
70  
ready for  
label

1966 Virginia

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

47924

Viola  
occasional

VI 25

Viola  
common

VI 26

Carex

label written

1966 District of Columbia  
June 4. Capitol Hill

VI 27

Lepidium sativum L.  
weed in garden

Shen. Nat. Park

71

flowers purple.

flowers purple, white in  
center, lower petal striate.

petals white.



1966 Virginia

June 17 - Ravensworth 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 *Flex. opaca*.  
*Polystichum acrostich-*  
*oides* 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 7:30 p.m. Delay in NY.

June 21 - arrived Paris  
12:15 p.m. left Paris  
1:40 p.m. an. Geneva. 2:40

Overcast and slight rain  
at Orly.



1966 ~~Switzerland~~ FranceJune 21 <sup>above Thoiry</sup> ~~s.e.~~ 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 ~~the~~ hedges  
forming woodland,  
tending to go back to  
forest. Above this a  
belt of deciduous  
forest - *Quercus* with *Fragaria*  
*Filix*, *Acer*, etc.

850 m  
+ up

Above this a belt of  
*Abies*. Above the ~~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 ~~at~~ about 2 m  
and there ~~is~~ is a boggy  
moss coating on rocks.  
This is limestone country  
and ~~instead~~ 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~~  
~~undergrowth~~ undergrowth.  
*Panicum nigrum*, *Rosa* sp.  
Almost without *Prickles*  
A couple of *Saxifraga*.  
*Paris quadrifolia*.

Beeches here are ~~mostly~~  
small-leaved, almost  
look like *Nothofagus*.

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



1966 France

June 21 - s.e. slope of Jura mts.  
above and s.w. of ~~Choiry~~ Choisy  
w. of Geneva.  
in coniferous forest

76  
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100

- 47928 *Cotoneaster tomentosus*  
on open limestone exposure
- 29 *Viburnum lantana*  
~~very common~~ occasional  
in scrubby spot
- 30 *Laburnum*  
very common in scrubby areas
- 31 *Lonicera*  
occasional in scrubby area
- 32 *Ranunculus*  
common in openings
- 33 *Ajuga*  
in open meadow
- 34 *Lamium*  
in open meadow
- 35 *Galium boreale* L.  
common in open meadow
- 36 *Asperula*  
on limestone rocks in opening.

- 950m shrub 1 m. tall, bushy,  
buds white.
- 1000m shrub 1.5 m. tall, fruit  
immature
- 1050m large shrub, 3-4 m. tall,  
racemes pendent, flowers  
bright yellow.
- 1200m shrub 1.5 m. tall, fruit immature.
- 1250m flowers white.
- 1100m. flowers deep blue-violet.
- 1100m flowers yellow marked  
with red.
- 1100m flowers white.
- 1300m flowers white.

2 p. 116



1966 Switzerland

June 25 - left Geneva 6:43 a.m.  
 (taxi 5 fr.) by rail. (fare to Vevey <sup>77.20</sup> ~~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  
~~at~~ 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  
 city.

7:25

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  $\frac{3}{4}$  or more. Some small orchards. Much pasture. Hedgerows of trees. Vanderens.

Some conifer forest, then mostly beech. Much pasture, then mostly cultivation - esp. grains. 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.

Schmitteu

More hilly, more wooded - or in follows a ravine.

Forest mostly beech.

Continues to get more hilly. Some beets + potatoes, as well as grain.

Flat-lying alluvial flats.

Then much less relief.

Wide flat land around Bern.

8:33

arr. 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 99B

Zägertochi

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  
Dummenauf.

River.

Rather steep slopes cult. & in  
pasture.

Langnan.

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. Forest mostly  
coniferous - Picea.

Then a broad more open valley  
with gentler slopes. Pasture  
and hay meadow. This continues  
a good distance.

Schiöpfheim

Entlebuch

River gorge is 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 part cult.

Orchards and grain. Orchard  
with dense grass ground  
cover.



June 25 - trip by boat on Lake  
~~Fucerne~~ (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 Fucerne end of the lake are almost all *Fagus* at anything like the elevation of the Alps. 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 Fucerne is about on the transition between oceanic and continental climate 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 ~~is~~ along the lake. Limestone shows some chimney erosion but few karst features.



June 27. trip up Mt. Pilatus  
 Left Lucerne by boat, 7:15 a.m.  
 to Alpnachstad. 7:40  
 Cross railway to Pilatuskulm.  
 At base of railway the rock  
 is a thinly bedded phyllitic  
 shale. Plants on this in  
 crevices and on slight  
 accumulations of soil.  
 2 spp. *Hypericum* in flower.  
 Silene.

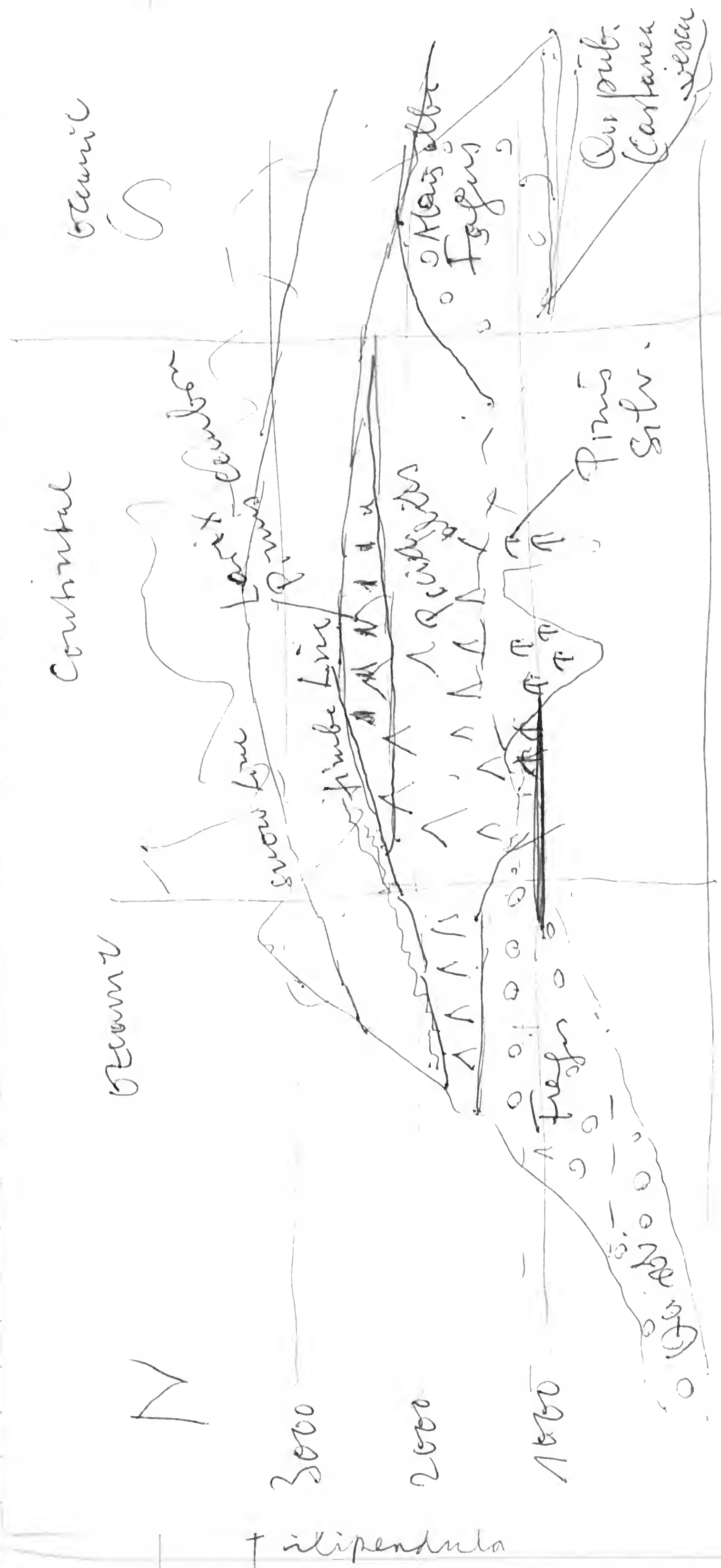
Steep meadow with  
 a number of species of  
 herbs in flower.

Beech forest, with a  
 little spruce locally.  
 Some admixture of oak,  
*Sorbus*, *Acer*, etc. - *Fragaria*.  
 Little or no undergrowth  
 and only a thin herb layer.  
 Rock changes to limestone  
 a little way up.

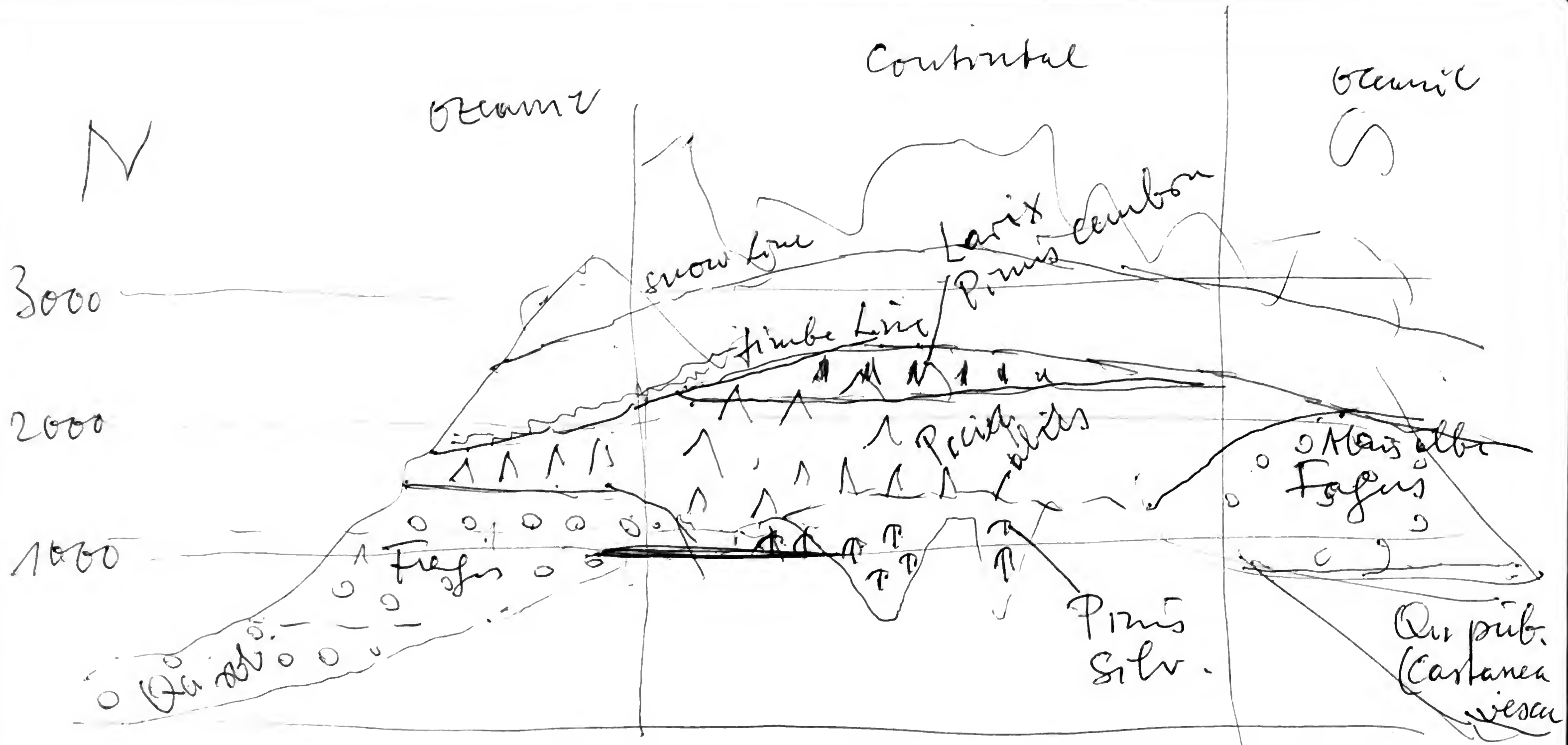
Forest becomes scrubby  
 and mazed upward.  
 There more & more conifers.

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  
 with lots of *Juniperus*, this









June 27 - trip up Mt. Pilatus

Left Lucerne by boat, 7:15 a.m.  
to Alpnachstad. 7:40

Cross railway to Pilatuskulm.

At base of railway the rock is a thinly bedded phyllitic 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 oak, *Sorbus*, *Acer*, etc. - *f. rosinus*.

Little or no undergrowth and only a thin herb layer.

Rock changes to limestone a little way up.

Forest becomes scrubby and mazed 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 patches of *Juniperus*, this

very compact and prostrate and scattered open patches of *Pinus*, prob. *P. cembra*.

These high meadows seem very badly overgrazed, criss-crossed 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. *virgata* form)

*Taraxacum*

an umbellifer like *Sonchium*

*Pedicularis* (yellow) (purple)

*Ranunculus* (2 spp. white + yellow)

*Polygonum*

*Lagena*? or *Arenaria*

*Dryas octopetala*

*Carex compacta*

*Woodsia*? sp.

*Myosotis*

*Salix herbacea* + *retusa*

*Laxifraga*? <sup>airioides</sup> 2 spp.

*Silene acaulis*

*Oxytropis*

*Cotula*?

*Thlaspi* or other <sup>like *arabid.*</sup> *crucifer*. 2 spp.

*Helianthemum*

*Sesleria caerulea*

*Filipendula*



*Inula* (white)  
*Trollius*  
*Galium*  
*Dominicum*  
*Draba*  
*Cerastium*  
*Arenaria* or *alpine*?  
*Festuca* sp. *peruviana*

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 - Seeburg - Hermitage across lake to Trübchen, back to Lido and back to Lucerne.

Lower slopes a mosaic of beech woods and open green meadow. 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*, *Filix*, *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.



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 or  
dammed river on ~~left~~<sup>right</sup>, ending  
in a marsh, then a flat  
narrow valley, a slope  
of 50 m. or so on ~~left~~<sup>right</sup>. 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  
n. on rt. side. Widens into  
a somewhat rolling plain.  
Then a lake on rt. scattered  
small areas of wood -  
beech or spruce, and of  
orchards. Mostly grass,  
some wheat, potatoes, etc.  
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.

(stop)

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 Sinsbrugg  
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 <sup>east</sup> slope

Hay mowed and drying on r.r. cut.

Zürich Wollishofen

- Zug

- Zürich

r.r. Zurich to Buchs

left 3, 8:41 p.m. Lake on left.

Same route as far as Thalwil.

From Thalwil followed lake

shore

Richterswil

Luzern

Buchs 10:16 p.m.



1966 Switzerland - Liechtenstein

July 3 - r.r. trip Buchs - Vienna.  
Left Buchs 9:39 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 - (see 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 fan, 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.  
n. 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 base, 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 slope  
become more moderate.

Dalaas.

Mosaic of woods and meadow.  
Mostly spruce with some  
beech on rt., more spruce on left.  
crossed a terrific canyon entrance  
for left.

Striking wildflower displays  
on unknown bits of meadow.  
Salvia, Orchis, Ranunculus,  
Anonis, 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. med. long tunnel.

Open spruce forest on rt.  
<sup>very</sup> long tunnel. emerges at

Stanton am Arleberg

Valley with grassy lower  
slopes, coniferous forest above.  
considerable larch with  
spruce. Higher slopes bare,  
grassy ~~or~~ with snow patches.  
Stream now flowing out.  
Beautiful high country here.  
Bare peaks with patches  
of heath and of snow. Small



cirques with snow accumulation.  
On valley floor hay is curious  
little cylindrical-verticillate 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  
was 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 some.

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 bottoms,  
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 slope on left.

Ötztal. small lumber mill.



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

Valley has wide floor here. left slope (n side) very rocky + steep, rt. more gentle - meadows + spruce-larch forest.

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.

Rounder 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 north 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



1944 Austria

Mts. become somewhat more rugged. Good cliffs on it.

Bald rocky mts. on left. Ruins of a castle on it. Valley narrows somewhat. Towns & villages common along valley floor.

Larch-spruce forest on slopes to it. Mixed spruce and broadleaf forest on lowest slopes on left.

Kundl

Mts on it. become steep and rocky.

Bald rocky mts. in distance on left. On it. rounded and wooded.

Wargl.

Beyond Wargl on branches to it. from Inn valley up a small tributary, bet. beautiful wooded low mts. mixed spruce & various broadleaf trees. Then pure spruce on it.

Valley winds upward and on. down 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 gentle and more grassy. Hay and pasture in flat bottom.

Valley broadens out. A spectacular cork'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.

Kitzbühel

we go down a small valley from here. This becomes wide and mostly grassy. at foot of cork's comb-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.



Some beech forest locally on hills in valley. Hilly valley, partly wooded for some distance.

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

### Hochfilzen

U shaped valley - rocky bare range on left, gentler wooded mts. on rt. ~ ~.

going down-hill. Peaks to left are spectacular

Middle slopes 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 ~~mt~~ seem to have a mixture of grass and Calluna.

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

Great snow peaks ahead down the valley.

### Saalfelsen

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.

m skirts shore for some distance.

### Zell am See

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

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

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

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-beech, with meadows on gentler slopes.

Schwarzach-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 large 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 *Filix*, *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 mt.

Also on left in distance.

many *siguilles* + domes on mt. 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 mt. 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 ones on mt. Some snow on those on left. Willow + alder thickets ~~are~~ 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. Floor broad and terraced.



High range to left,  
low, wooded to rt. Apparently  
mixed conifer + 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 spruce 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.



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.

<sup>thg</sup>  
Ansbang - 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 series of low  
terraces, mostly cultivated.

Grain sugar beets, etc. hay.

Plain now very extensive,  
esp. to rt. a bit low hilly to left.

Mostly open 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-leaved.

Thickets along watercourses,  
but these 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  
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.



## St. Valentin

Low hilly land on left,  
flat part. 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

Open 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 it.

## 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 poplar  
for a few m. on banks.

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.

## Vöcklabruck

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 it leaves river  
and goes through gently  
rolling cultivated country,  
with some patches of woods  
on low hills.



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.



114

1966 Austria - Switzerland

July 6 - air trip Vienna - Zurich -  
Geneva.

dep. Vienna 6:30. ar. Geneva 9:30

115



1966 France

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

near les Roches de Faverges<sup>er</sup>

1260 m.

X 2 47937 *Campanula persicifolia*  
very local in grassy meadow  
partly shaded

flowers blue-violet

X 2 38 *Brachypodium*  
common in meadows

leaves yellowish green

V 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*  
road cut

fls. violet, palata white,  
marked with maroon

X 2 43 *Campanula rotundifolia*  
road cut

flowers deep purple

X 2 44 *Campanula*  
common in meadow

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

1966 France

labels typed

79

49750

*Thesium*

common locally in meadow

x 2

x 2

51

*Asperula glauca*

~~to~~ occasional in meadow

x 2

52

*Dianthus*

common on ledges

x 2

53

*Armelanchia*

common on ledges

x 3

54

*Arctostaphylos uva-ursi* L.

common on ledges

July 10 - <sup>near</sup> Coldchae, 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~~ among  
limestone outcroppings in meadow  
on <sup>open</sup> 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

*Geranium vivale*

rare in small openings in  
forest.

(to h. 122)

yellowish green

~~to~~ corolla tube pinkish in  
bud, flowers white.

— corolla bright pink,  
calyx dull maroon.

— shrub 1.5 m. tall,

— fruits black when ripe.

— forming mats,

leaves glossy; fruit  
immature.

1250 m

flowers lavender

...

stems erect

1370 m

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

1300 m

shrub, 1 m. tall, leaves  
glossy beneath, flowers  
bronze-yellowish to red.

— stems erect, flowers white

sepal maroon, petals  
whitish turning reddish  
bronze.



#7 July 10 Lac Pass,  
Jura mts

Road ascends from the village of Farges, first through open land then thickets and irregular brush, then at about 600 m into forest, largely beech and other deciduous trees, some Pines. 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 <sup>along</sup> 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 ~~the~~ it widens into a long narrow meadow, now wide, 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 ~~at~~ very common, also *Thymus* sp. and *Satureja* in rock crevice. Quite an abundant and varied meadow flora.



nos. checked 1966 France

122  
Labels typed

47962 *Galium pumilum*  
X 2 common in small openings  
and meadows

X 3 63 *Satureja*  
among limestone outcroppings  
and boulders on <sup>the</sup> summit ridge

1370 m. stems erect, flowers white

" flowers bright purple;  
plant strongly aromatic  
when broken.



July Relay Station on ridge of Bull Run Mts.

crest of ~~the~~ ridge is a quartzite outcrop

low scrub of *Gaylussacia baccata* between rocks

<sup>a few *Kalmia latifolia*</sup> 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 intermountain valley -

quartzite ridge with almost pure *Quercus prinus*, *Vaccinium*, etc. forest on slopes more mixed.

Valley bottom with small brook with an area of moist bottom-land. Rich

herbaceous flora - *Oxodes*, *Symphlocarpus*, *Circaea*, *Thalictrum*, *Arisaema*, *Desmodium*, *Athyrium*, *Galium*, *Smilacina*, *Carex* spp.

*Anemone* ~~(*A. sp.*)~~, *Amphicarpus*, *Apocynum*

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* ~~etc~~ *rigida*, locust, ash, persimmon, birch, *Morus rubra*, *Sassafras*, *Nyssa*.

irregular, 70% 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 *Apocynum*



Labels 7/7

Each subordinate layer largely composed of young plants 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

- 47964 ecq.
- x 2 very local among sandstone boulders
- x 5 65 *Circaea quadrangulata* var. *canadensis* (L.) Hara forming a large colony many meters across
- x 4 66 *Ceanothus americana* occasional along an old trail
- x 5 67 *Aquimonia* common along old trail
- x 4 68 common along old trail
- x 1 69 *Phryma leptostachya* L. rare along old trail
- x 2 70 *Carex* rare along old trail
- x 2 71 *Utricularia perfoliata* abundant
- x 1 72 *Circaea quadrangulata* var. *canadensis* (L.) Hara local

twines, flowers magenta.

terrestrial - bearing rhizomes white, slender, branched; petals white.

suffrutescent herb or sub-shrub, fruit green, erect, flowers deep yellow.

flowers pinkish.

small tufts

flowers white.



1964 Virginia

no. checked  
128  
label typed  
47973  
8  
x2 74

*Galium latifolium* Michx.  
~~*multiflorum*~~  
common on slopes  
*Conopholis americana* <sup>coll.</sup> Wallr.  
very local, near  
oak tree and Pinodendron.



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

47975 Galium triflorum Michx.  
common

76 Luteolaria ovata var. rugosa (Wood) Fern.  
rare, only a small colony seen.

77 Galium circaeazans Michx.  
common

78 Paronychia canadensis  
locally abundant, on  
patches of bare soil

79 Agrostis perennans  
rare, along trail

80 Carex alopecuroidea Tuckerm. ?  
rare, along trail

81 Amphicarpa bracteata (L.) Fern.  
locally abundant

82 Dennstaedtia punctilobula  
~~to~~ common to abundant

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

83 Bromus cf. pungens  
locally common

Aug. 1 - Big Meadows Picnic Ground  
under trees

84 Agrostis alba L.  
common

prostrate, roots yellow.

erect, filiform - white  
stolons abundant.  
stems ascending to  
erect.

tufts, culms ascending.

culms spreading.

sterile twines.

rhizome buried.

culms strongly ascending  
panicles with branches  
drooping.

culms decumbent, spreading  
from root crown.



Aug. 1 - Crescent Rocks

Paths are much overgrown.  
No *Potentilla* nor *taxifraga*  
seen. *pedicularis* 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 forest. Soil  
thin, very rocky. Mostly  
*Quercus prinus*, but  
some *Q. alba*, *Acer pennsyl-*  
*vanicum*, ~~to~~ *Q. coccinea* (?)  
or *Q. velutina* (?), *Betula lenta*,  
with a  
variable *Ericaceae*  
shrub layer, up to 3 m.  
or more tall. *Rhododendron*  
*catawbiense* common locally,  
*Kalmia* more general,  
*Menziesia* also.  
*Rhododendron* (*Azalea*) spp.  
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.



Aug. 1 - above headw. of  
Big Branch, 0.9 km.  
e. of Riprap Overlook

in rather thin woods,  
largely *Quercus prinus*, ~~with~~  
on very rocky thin soil. on north slope

47985 *Betula papyrifera* var. *cordifolia* (Ragel) Fern.  
very common in very limited areas

86 *Viburnum*  
under white birches

87 *Hedyotis purpurea* var. *tenuifolia*  
occasional

88 *Vaccinium angustifolium*  
common in dwarf-shrub layer

89 *Vaccinium vacillans*  
abundant in dwarf-shrub layer

90 *Gaultheria procumbens*  
abundant in dwarf-shrub  
layer

91 *Vaccinium vacillans*  
abundant in dwarf-shrub layer

92 *Vaccinium*

93 *Rhododendron catawbiense*  
scattered locally, ~~on north slope~~

Aug. 1 - Crescent Rocks  
top of sandstone cliffs

94 *Poa*  
very common in open in crevices

95 *Agastache nepetoides* (L.) O. Ktze.  
rare in thicket

96 *Polygonum convolvulus* L.  
common in open in crevices

2500'

many trunks from base,  
8 m. tall, white.  
sterile dwarf plants  
only, seen.

1 - 2 dm. tall, leaves  
dark, semi-pellucid, sterile.  
2 - 4 dm. tall, berries blue.

about 1 dm tall or less.  
flowers white

2-4 dm. tall; berries blue.

1-2 dm. tall, leaves green  
on both sides, pellucid-veined.  
shrub 3 m. tall.

erect, 0.8 m. tall.

twining.



Aug. 2 - Lands Run Falls  
1 1/2 mi. w. of Compton Gap.  
on ledges of rock cliffs

1850'  
300 m

47997  
3

Betula  
one or two plants

98

Muhlenbergia cf. sobolifera  
very local

99

Woodsia obtusa (Spreng.) Torr.  
rare

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

400 m

48000

Verberna antiochifolia L.  
occasional

01

Boehmeria cylindrica  
common on rocks in stream

02

Laportea canadensis  
very common

03

Galium asprellum  
occasional

04

Agrimonia rostellata Vahl.?  
rare

05

(grass)  
common

06

Leonurus cardiaca L.  
common

07

Hackelia virginiana (L.) Jtn.  
rare

08

Phryma leptostachya L.  
occasional

09

Cryptotaenia canadensis (L.) DC.  
common

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

fronds wilted, dried up  
when collected.

erect; flowers white.

a number of stems from  
base.

erect stinging herb,  
flowers greenish.

weak, procumbent.

erect; flowers yellow.

erect, very small tufts.

erect, somewhat aromatic  
when broken.

flowers white.



48010

*Lindera benzoin* (L.) Bl.  
common

X4

X3

(1) *Polymnia canadensis* L.  
common

X1

(2) *Actinomeris alternifolia* (L.) DC.  
rare

Aug. 2 - north entrance  
to Park just south of  
Front Royal  
in thickets at edge of woods  
(3) *Gymnocladus dioica* (L.) Koch<sup>ch</sup>  
small colony of  
young trees

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

200 m

sterile shoot 3 m. tall,  
leaves glaucous beneath.







