RECORD

Collection and Field Note Book

No. 70

(Nov. 17, 1963 - Dec. 29, 1963)

(1444p -- 1465p)

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Collection and Field Note Book

No. 70

(Nov. 17, 1963 - Dec. 29, 1963)

(44449 -- 44652)

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MAN AND NATURE

Saving the Wilderness Aim of Conservationists

This article was prepared for The Tribune by a leading figure in the field of conservation for the 29th annual observance of Conservation Week in California. It was arranged through the co-operation of the Oakland Park Department and the California Conservation Council.

By DON GREAME KELLEY
Western Regional Director, the Nature Conservancy

"If some bits and pieces of our unique wild landscapes are going to be saved as samples of what we had, there's just one way it's going to be done," a small group of biologists said to each other in 1917. "We've got to do it ourselves."

That was the beginning of America's largest and most influential "do - it - yourself" conservation group now in operation. From that early start as a committee of the Ecological Society of America — a handful of scientists who foresaw the eventual disappearance of the natural areas so vital to their research in plant and animal life histories —sprang what is now an 8,000-member national organization with nearly a half million dollars working capital. This is The Nature Conservancy.

NON-PROFIT GROUP

Taking this name at the time of a major reorganization in 1950, the Nature Conservancy is a fully independent, private, non-profit organization incorporated in the District of Columbia and California — in this state in 1957.

It is run by its members, who annually elect a board of governors of some 35 dedicated volunteers — business and professional men and women to whom the preservation of our wild land heritage is worth a great deal of their time and, for some of them, their money.

The capital they work with is largely a matching and loan fund contributed by principally two or three foundations. This revolving fund is used to buy land, and is replenished by fund drives staged by local Chapters to finance projects they sponsor.

PROFESSIONAL STAFF

It is a grass-roots operation, aided by a small professional staff, an executive director, in Washington, D.C.— a retired New York school superintendent, Dr. Walter S. Boardman — with two assistants and a small office force; and a Western regional director, Don Greame Kelley (formerly editor of "Pacific Discovery" magazine) and secretary, Mrs. Walter Williams plus one part-time typist, who staff the Western regional office at 1711-A Grove St., Berkeley, from which they manage conservancy affairs in the 13 Western States, Hawaii and Alaska, included.

The conservancy's most notable Western — if not national — achievements are the acquisition and holding for the State of California the two top-priority tracts of future park land wanted by the State Division of Beaches and Parks. These are the Forest of Nisine Marks, 9,750 acres of mountain and forest in Santa Cruz County which the conservancy purchased in 1962 for about one-tenth of its market value through the generosity of the public-spirited owners, the Marks family of Salinas; and the Rancho Montana de Oro, 4,750-acre portion of an old Spanish Grant in San Luis Obispo County, with rugged mountains and nearly two miles of rocky ocean shore, which the Conservancy is holding for the State by means of a Deed of Trust and purchase option.

LARGE-SCALE OPERATION

Just to top off this record of large-scale operation in the public interest, the Nature Conservancy has, in the first few weeks of 1963, wielded some influence and exerted some leverage to get under way the land acquisition program for the new Pt. Reyes National Seashore.

National president this year is George L. Collins, retired National Park Service official, of Ross, Marin County. He and a fellow conservancy governor, Mrs. Richard M. Leonard of Berkeley, are in partnership with Mrs. Russell Varian, of the Varian electronics firm, as conservation associates in San Francisco.

HEADQUARTERS

The conservancy's Northern California chapter has its headquarters in Berkeley, under the chairmanship of Walt Mulbach of the Oakland Schools' natural science teaching staff.

It was a 6,400-acre virgin Douglas fir and redwood forest project on the Eel River in Mendocino County, the Northern California Coast Range Preserve, which brought the Nature Conservancy to the West in 1957. Some 855 people have contributed over $97,000 to the purchase of this land.

From its minuscule beginning effort of 45 years ago under another name, The Nature Conservancy has grown to the point where its determined governors, members, and staff — amateurs all in real estate deals — now charge boldly into operations which give cautious businessmen pause. Their attitude is that the need to save land is so urgent, the time so short, that the bold imaginative and sometimes unorthodox approach is often the most likely to succeed. They are however, always humbly mindful of their role as trustees of other peoples money and land, as they go resolutely on with their do - it - yourself conservation program.

Next: Wildlife Refugees

Junior Science Symposium Student Papers Published

BERKELEY — Twenty-five of the scientific papers presented by high school students at the First Northern California Junior Science Symposium have been published in "Particle," a science magazine produced locally by science students.

Included are the research findings of Thomas J. Blattner of Walnut Creek, Larry Faltings, David Hartman, Jan E. Matthews and Kenneth D. McMilin, all of Livermore; Josephine Fifi, Elizabeth Sullivan, Rhonda Trihub, Lynne Turpin and Carolyn Traverso, all of Berkeley; Judith G. Williamson of Albany and Gary Smith of Antioch.

The symposium was conducted by the University of California Extension last May and presented the results of research by 200 Northern California high school students. Papers published range from measurement of the velocity of sound to the effects of drugs on spiders' ability to spin webs.

"Particle" is a quarterly magazine which serves as a medium of communication among high school and college science students.

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For the first time on Guam a cultural film series is being offered. The films to be shown represent the highest achievement of cinematic art, from eight countries. Collectively, they have won every film award and distinction possible.

All proceeds for the series go towards the production of the College's annual, the CORAL. The series consists of eight films, for which one may see seven films for $5.00 and all eight for $6.00. Due to the benefit status of this series it is impossible to have children's prices.

Screenings will be made at the Tumon Junior-Senior High School Audio Visual Room. This room is air conditioned and seats 175 people. Show times will begin at 7 PM. Tickets will only be sold at the door when available.

The Films:

February 23 & 24----------PATHER PANCHALI (from India)
(Sunday at 1 PM and 7 PM)
In Hindi, with English sub-titles. Probably the most celebrated foreign film of the past ten years and winner of the Cannes, Stratford, Edinburgh, Vancouver, and San Francisco Film Festival awards.
One of the best views of Indian rural life ever dipicted and outstanding for its pure beauty of humanism and cinematography.

March 8,9, & 10----------Ballad of a Soldier (from Russia)
and Visit to Picasso (short)

In Russian, with English sub-titles. The best Russian film since World War II. Winner at Cannes and San Francisco, a new Russian director emerges to take up where Eisenstein, Pudovkin, Dovzhenko, and Tisse left off. Grigori Chukhari's Ballad of a Soldier is the account of a Russian war hero returning home to visit his mother. The scenes of destruction at home bring forth the realization that war is the plight of mankind.

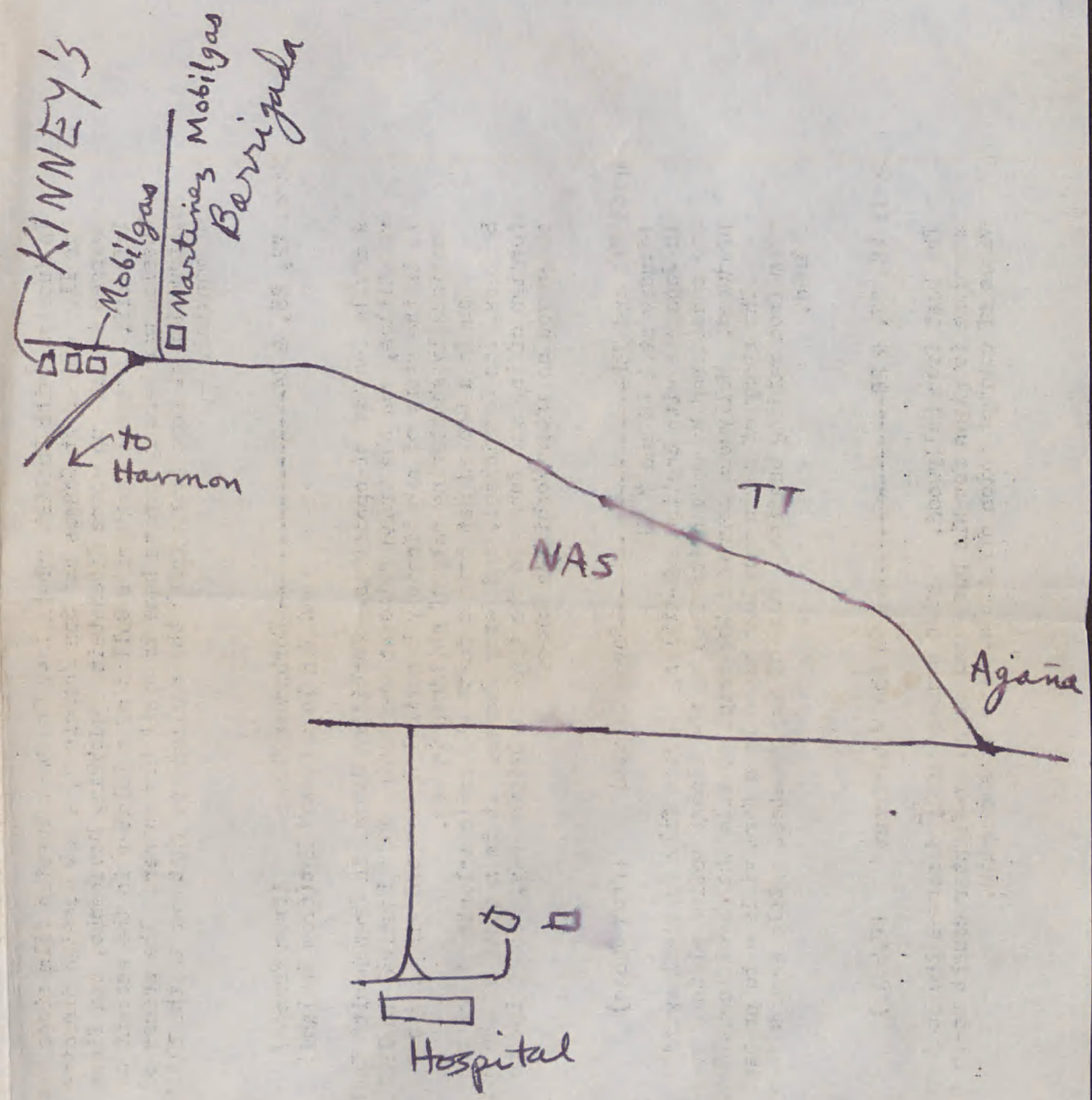
March 22, 23, & 24----------Forbidden Games (from France)
and Man In a Cocked Hat(from England)

A double feature of opposites. Forbidden Games, in French with English sub-titles, won the Grand Prize at the Venice Film Festival in 1952. It is the story of a delicately beautiful 5 year old girl and her emotionally shattering tale of children in war.
Man In a Cocked Hat brings forth the comic talents of Peter Sellers, Ian Carmichael, and Terry Thomas. It is a spoof of the British foreign office and funny in the typical British way. Something to cheer you up after Forbidden Games.

April 5th and 7th----------Seven Samurai (from Japan)
(Sunday at 1 PM and 7 PM)
In Japanese with English sub-titles. Venice film festival award and considered by many critics to be the finest motion picture ever produced. Hollywood borrowed the script to film the Magnificent Seven.
The story of seven warriors hired by a farm village to protect them from raiding bandits. Some of the greatest battle scenes ever filmed.

April 26, 27, & 28----------On the Waterfront (U.S.A.)

The best from Hollywood. Marlon Brando justly deserves the academy award he is given for his portrayal of an ex-fighter caught up in the vices of corrupt union officials. One to see again.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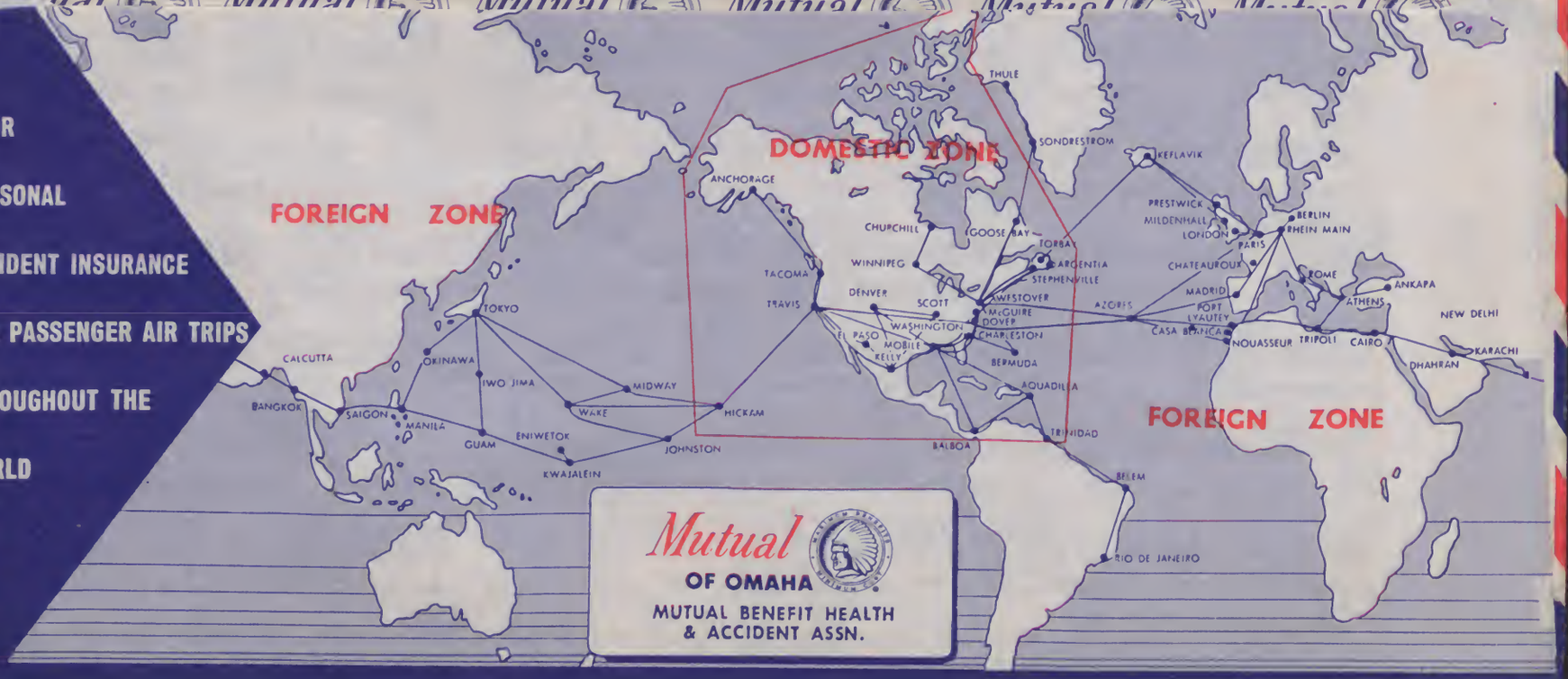

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1963

Nov. 17 - Flight Washington (Chantilly) to Chicago, rt. side of Boeing 720.
West of Chantilly, mostly cultivated and pasture, about 20-25% in woods, lessening westward.
some color left, tops of many trees pinkish or orange. Color lessens westward.
Quite a few ponds.
Blue Ridge solidly wooded except for scattered clearing along top.
In Shenandoah V. little wood except on rough spots.
Westward the first sharp mt. ridge has a small enclosed valley somewhat like Fort V. but with no open ground in it. A reservoir on so. side.
Valley and ridge pattern rather broken to north of this route. Gaps and irregularities are almost the rule, except that one or two ridges are very sharp and straight.
West toward Wheeling the mountains become very irregular, and hard to perceive as definite

1963 Ohio Colorado

ranges, and west of Wheeling in Ohio, is an irregularly dissected, rather low relief, area, not arranged in n.-s. ridges. (Clouds.)

Nov. 17 - flight Chicago - San Francisco - same seat and plane. Takeoff 10:10 am. cloudy.

@ 11:40 it is clear and the land entirely cult. except a diagonal strip at about 45° to the course crossing from behind rt to left. about a mile? wide completely bare. following an almost dry river on its north side. Small dunes? on surface. Some uncult. land in distance to north. River swings to bit to north where we cross strip, but strip does not follow it. Must be S. Platte. Snow to north a little locally on course.

Mts. with much

snow visible ahead

11:58 River swings a bit north. Light snow continuous. Much uncult land, and an intricate pattern of barchans along river. Wind must come from n.w. Cultivation along course. Several large reservoirs in sight.

12:00 Foothills a little way ahead, then snowy peaks of Front Range. Continuous snow along course not thick but none to north.

12:12 Passed Denver on left. Many small ponds out. Transition from plain to foothills very abrupt. but ravines cutting the alluvial fans.

In the eastern part of Rockies the pattern beyond a vague n.-s. trend of snow-covered ranges is difficult to discern. Then

12:15 a narrow area of sharp, curving n.w.-s.e. ~~courses~~ ~~ll~~ trending ridges then a dissected plateau of flat-lying beds

with dendritically arranged canyons with steep walls.

12:25 Then a broad valley with an incised meandering river, very muddy, and some flat cultivated land and some dissected flat bedded multicolored rocks.

The river bends west along course in a vast, almost undisturbed drainage basin

12:28 with a highway crossing it toward n.e. A few evidences of attempts at ranching. Little vegetation. Valley rimmed by a reddish scalloped terrace obviously a resistent bed.

12:30 Highly dissected area of flat ±, sedimentary beds. Only patches of snow in this entire area. Drainage very complicated.

Sedimentary structure very conspicuous.

12:34 A vast bare valley, little relief, a strip of cultivation for a short

distance (Green River Valley), mostly desert.

12:35 A colorful and ruggedly dissected plateau west of it. Little vegetation. Snow covered ranges to west and north.

12:37 An abruptly dissected part of this plateau with mesas and box canyons, these intricate. Drainage to west into a long, ne-sw trending valley cut into red-rock.

12:41 A snowy range extends to north, another just ahead. Several high snowy peaks far to north.

12:43 Patches of good conifers present on some slopes.

12:45 Another n.e.-s.w. trending broad valley, flat bottom of light red soil, largely cultivated. On west of it another snowy range. Canyons on east slope of this bright red.

12:47 A black area, probably a lava flow, in middle distance to north, in valley west of the range. This valley broad, flat, partly cult. From it, over a small

range, Great Salt Lake.
Thin snow in this region, none around and to west of Salt Lake.
(This is perhaps only the lake at Provo - has not night outline for G.S.S.
West of it a vast desert, with scattered mountain ranges, with some snow.
This desert system drains northward, seems undisturbed except for a few roads and several check-dam reservoirs on water-courses.
12:57 Mountain ranges have open forest.
A high one to north.
12:58 Stream system with parallel tributaries running north and east of high mt.
Some roads on this.
12:59 Generally higher land, with open forest.
Then broad desert valley.
1:01 N.-S. valley with hwy. + r.r. & some cultivation.
Various rather small ranges.

Some roads in these valleys, but little cultivation.
1:04 A n.e.-s.w. trending valley with a marshy bottom, and several dams and mines reservoirs. Broad desert to west.
Then a n.e.-s.w. trending system of mts.
1:07 Then a large desert basin, with internal drainage. Little disturbance except road on s.e. side.
1:09 Enormous desert area with small, rough, mts., lava flows, mesas.
A few roads, little evident disturbance.
1:11 Broad valley, n.-s. or s.n. drainage. small dunes, a small volcanic cones and a main highway trending s.w.
Then a rough, slightly wooded area of mts.
Desert valley and more somewhat wooded mts. to n.w.
Entire central Nevada is desert with scattered mild to rough mt. ranges or patches. Thin snow on lower ones, more higher.
A few roads.
1:14 Overcast visibility some.

1963 California

1:30 Complex of rugged snow-covered peaks lower to northward, and fading out to foothills to west. (Sierras) Between snowy peaks and forested west slope a vast rough area of bare granite with a scattering of nice little lakes. A large reservoir just on course - belt of
1:34 bare rock above shrs.
Thick haze.
1:40 ~~Bay~~ Central Valley entirely cultivated except for very narrow gallery along a closely meandering small river, along course.
1:42 Then Sacramento R. also meandering.
1:43 Foothills to west bare.
Higher mts. open to closed forest or brush on n. slopes, mostly grass or small brush on s. slopes.
Then, savanna to closed forest, more open on s. slopes.
Then some slopes chaparral covered other open forest to savanna.
Chaparral in a large valley running to n. w.

In higher mts, patches of orange deciduous oak? among gray-green evergreens.
Generally more wood on n. or n. e. slopes, less on south & west.
Swinging in around s. end of S F Bay. Large reservoir back among hills about e. of s. end of bay.
Hills facing bay wooded only in ravines.
Some marsh still exists around s. e. end of bay, but mostly diked to salt pans. These various shades of red to purple.

1963 Hawaiian Is.

Nov. 21 - Honolulu (School St. near Bishop Museum), Oahu I.

44449 (comp.)
3 with M.H.S.
common in weedy trampled place along sidewalk.

Nov. 23 - Hilo Hawaii I.
2 50 Wedelia trilobata (L.) Hitch.
planted as an ornamental

Hawaii I.
Nov. 21 Land of Manuka, Kau Dist.
1700' "makai" of road, 3/4 mi. N. of Manuka Pa
4 51 Ilex
planted

Hawaii Volc. Nat. Park
Nov. 23 - Kipuka Puaulu, Kilauea, Hawaii Volcanoes National Park in mixed moist broadleaf forest.
2 52 Coprosma rhynchospora Gray
locally very common, reproducing abundantly.

53 Veronica
common along trail
54 Psychotria hawaiiensis v. hillebrandii
very common

2 55 Muhlenbergia?
local along trail
1 56 Coprosma rhynchocarpa Gray
very common

prostrate, forming mat; flowers yellow.

Ilex locality data
Collected by Violet Hansen 11-21-63
Land of Manuka, Kau district, Hawaii.
1700± ft. makai of road, 3/4 mi. N. of Manuka Park, in old experimental planting area known locally as "Kanaka Garden."
4 plants - 6-10 ft. high

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cending;
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a garden"
ight;
red when ripe.
hered by Mrs. Violet Hansen)

tall, fruits
ly, apex
form a cylindrical

; flowers white

all, ripe
one stone in
fruit well developed, somewhat turgid, other thin, concave, sterile.

fruit rangered apex prolonged into a beak.

Flax locality data:

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Land of Manuka, Kau
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1700± ft. makai of
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Manuka Park, in old
experimental planting area,
known locally as
"Kanaka Garden."
4 plants — 6-10 ft. high

Nov. 21 - Honolulu (School St. near Bishop Museum), Oahu I.

44449 (comp.)
3 common in weedy trampled place along sidewalk - — prostrate, forming mat; flowers yellow.
with M.H.S.

Nov. 23 - Hilo Hawaii I.

2 50 Wedelia Trilobata (L.) Hitch. — prostrate or decumbent with tips ascending; flowers yellow.
planted as an ornamental

Hawaii I.

Nov. 21 Land of Manuka, Kau Dist. 1700' "makai" of road, 3/4 mi. N. of Manuka Park, in old experimental planting area known locally as "Kanaka garden"

4 51 Ilex — 4 plants 6-10 feet high; fruits bright red when ripe. (from bouquet gathered by Mrs. Violet Hanson)
planted

Hawaii Volc. Nat. Park

Nov. 23 - Kipuka Puaulu, Kilauea, Hawaii Volcanoes National Park in mixed moist broadleaf forest. 4050' 1235 m

2 52 Coprosma rhynchospora Gray — shrub 2.5 m. tall, fruits scarlet, fleshy, apex prolonged to form a cylindrical beak.
locally very common, reproducing abundantly.

3 53 Veronica — prostrate; flowers white.
common along trail

54 Psychotria hawaiiensis v. hillebrandii (Rock) 7 ft. — shrub 2 m. tall, ripe fruit orange; one stone in fruit well developed, somewhat turgid, other thin, concave, sterile.
very common

2 55 Muhlenbergia?
local along trail

1 56 Coprosma rhynchocarpa Gray — fruit rangered apex prolonged into a beak.
very common

1963 Hawaiian Is.

No. 23 – Lanai – from air
Ridges are still fairly well wooded, but all along the n.e. side are scars.
A deep erosion scar just windward of Kanepuu forest. Kanepuu forest seems from this altitude, to be fairly intact.

Kahoolawe – a few patches of grass of some size on top, surrounded by red completely bare soil.

Kohala area – Hawaii
The line bet. green and brown lies just overtop main ~~ridge~~ height of land toward Kawaihae. Pasture extends beyond sugar cane. Clearing extends almost to the summit of Kohala Mts. Many small cane scattered in pasture slope from summit toward Kawaihae and to some extent along south of summit ridge toward Waimea.
Just below a broad strip of forest which extends

toward Kohala from first of gulches ~~is~~ are patches of salmon colored vegetation in the green – possibly andropogon? A few small patches of this on lower parts of ridges between the first few gulches. None beyond about first 1/3 of cliffed coast.
Spectacular plateau bet. Waipio and next large gulch. Rather steeply sloping and lower part deeply dissected. Reminds me of Olokui.
A few scattered patches of forest remain ~~t~~ along Hamakua coast above cane fields and the pasture.

Kipuka Puaulu

Hogs have rooted around bases and have gnawed the bark off of a number of Coprosma trees. 3 b&w photos.

Modiola caroliniana

Most abundant seedlings & saplings are Coprosma.

On strip road - each old koa surrounded by copse of sprouts.

Lookout - koa shows a witches-broom type of disease.

Below is an area where many of the Styphelia are dead & dying stems covered by sooty molds.

Pulimau Crater -

Area of dead and dying lehua trees - apparently a recent development. Twigs dying back.

Juliette says this started 6 or 7 years ago, but I do not remember anything so conspicuous 2 years ago.

Charcoal in reticulite layer at Volcano House dated at about 2500 years.

1963 Hawaiian Is.

Nov. 23 – Hawaii Volcanoes National Park, Headquarters area, Kilauea — 4000' 1220 m

44457 Elaeagnus
6 one plant seen, around old dwelling site, undoubtedly planted, apparently not spreading — shrub 4 m. tall with abundant slender pendulous branchlets, flower white, fruit (rare) red, fleshy.

Nov. 23 – Hawaii Volcanoes National Park, top of Mauna Loa strip road, near lookout — 6650' 2025 m

1 58 fungus
parasitic on Acacia koa — forming a swollen witches-broom-like structure.

Nov. 24 – Hawaii Volcanoes National Park, Kipuka ~~Ha~~ Ki above Kilauea. — 4300' 1310 m

3 59 ~~Capsicum~~ Solanum pseudocapsicum
common in undergrowth in forest — shrub 1.5 m. tall, ripe fruit red.

Nov. 24 Napau Crater, Hawaii Volcanoes National Park — 2750' 840 m

2 60 Vaccinium calycinum
common in thin Metrosideros forest — shrub 1 m. tall, old leaves all dead from sulfur fumes – from eruption; flower green.

3 61 Vaccinium viticulatum sm.
common in open scrub of Metrosideros on 1840 lava flow. — 2800' 855 m — dwarf shrub 3-5 m. tall flower coral red with greenish tips, fruit red.

62 ~~Styphelia~~
~~common locally~~

Nov. 24 Napau Trail ~~bet. Mahas~~ above Pulu Factory — 2850' 870 m

2 62 Styphelia
locally common — leaves very slightly glaucescent.

1963

Nov. 24 - Alae crater
~~Nov.~~ Dec. 7 1962 eruption
A bowl-shaped new surface in bottom, with tree molds sticking up in bottom, after collapse.
Lehua forest on talus slopes has been largely killed - the lehua near bottom seem (thru binoculars) to be dead, farther up variously damaged.
Ladleria, Pipturus(?), Gleichenia apparently undamaged - also Cibotium, Astelia.
Some Andropogon immediately above edge of lava.
(several photos hod. & b&w)

Alae Crater - Aug. 22 1963 eruption.
A pool of lava in bottom. Lehua trees are killed along edges - still have leaves, but only a few feet up on talus, except where fires burned up the side, and on opposite side, where there were fissures on the side. 2 hod 2 b&w photos.
1 photo of "mezzanine" showing contrast bet. veg. on a Δ of 1940 lava and surrounding older flow.

Trail to Napau crater
- much Andropogon ving.
* Eupatorium riparium. Some Arundina. Cyperus polystachyos.

Part way along is an area where larger lehua trees are dead or dead in tops.

1840 flow, below Pulu Factory a dense layer, 1 m. deep, of Gleichenia, Machaerina, Lycopodium cernuum, a little Styphelia, and scattered slender Metrosideros 4 - 6 m. tall. Vacc. calycinum.

Lycopodium cernuum here seems to be dead in upper parts - prob. from SO_2 fumes of last eruption.
Arundina leaves are dead or partly so, but plants still flowering.
Some Vaccinium calycinum tips dead.
A little farther along many dead fronds of Gleichenia. Still closer tips of Machaerina are dead.

Napau Crater
(Oct. 5. 1963 eruption)
Large lava pool covering most of crater floor from a transverse fissure. Some concavity probably due to loss of gas. Hundreds of tree molds.
(3 b&w 3 kod. photos from end of trail on rim.)
Around edges across a narrow belt of heat-killed lehua forest.
Wind during eruption was blowing about back along trail, carrying sulfur fumes.
The forest along trail has lehua foliage sparse, apparently because most old leaves seem to have fallen and most of foliage is short (3-5 cm.) of young growth. All fronds of Cibotium are dead, but terminal bud OK.
Lycopodium cernuum mostly dead, some plants with lower part of stem still green.
Vaccinium calycinum with entirely new leaves, some flowers. Styphelia

with a few tips still green, largely dead.
Isachne partly dead but with some green tip.
Coprosma cf. menziesii scarcely affected. C. ernodeides not much, either.
Radlkofera cyathoides apparently lost most leaves but new ones have developed.
Epiphytic Elaphoglossum reticulatum ~~mostly~~ fronds mostly dead, but rhizomes still alive.
Hedyotis centranthoides not much affected. Machaerina not much affected.
Cyperus brevifolius not much affected.
Cyperus polystachyos ~~not~~ culms mostly dead, at least above, but sprouting well from base. Goodenia terminalis scarcely affected.
Most of mosses and hepatics on tree trunks dead, except Calypogeia.
Hypericum japonicum seedlings abundant, no old plants. Most terrestrial mosses dead or sick. (2 b&w 3 kod. photos looking from crater across (this). ~~most~~ applies around end of trail)

seedling of Nephrolepis lessertiana perhaps 4 cm. tall almost unaffected.

Cyrtandra c. cordata
not much affected.

Forest in gulch not
as much affected,
but epiphytic Lycopodium
phyllanthum dead.

Floor of crater is
of iridescent filamentous
copy patroclos.
Many lehua trees burned
off at base and lying on
edges of lava field.
several t.x.w. bird photos
also one each of tiny killock
kipuka.
On this tiny kipuka
all plants - lehua, Gleichenia
& Lyc. cernuum are dead.

Main kipuka on flow -
had been covered by a
closed layer of
a Machaerina ang.
a Lyc. cernuum
c Vaccinium ret.?
c Psychotria dist.
c Badleria
c Gleichenia
r Lyc. phyllanthum
c Styphelia
c-a Dubautia
o Polypodium pellucidum

r Hedyotis centranthoides
~~with~~ a
with a scattered open irregular
a shrub layer of Metro-
sideros, mostly 1-3 m. rarely
to 5 x 10 x trees to 7 m. tall.
Mosses incl. Rhacomitrium
Calymperes, etc. ~~these~~ +
Pterocaulon & Cladonia.
These cryptogams mostly
badly injured & dead.
All vascular plants
~~o~~ showing at least
some new growth except
the r lycopods.
Lehua badly injured,
most leaves in exposed
areas dead, tips growing
sprouts from trunk.
Styphelia and gleichenia
in rather bad shape.
Machaerina scarcely
injured except very
near edges and in exposed
places.
Other things more or less
damaged.
Aspect of veg. rather
brownish green, perhaps
more brown.
This is on an 1840 vent.

Up on rim again
Selaginella menziesii,
Gymnogrammitis tenuis &
Polypodium tamariscinum
all dead.

On other fork of
trail, at end, is a small
patch, perhaps 300 m x 100 m
along a crack vent
out of which spatter
came in fountains
and coated tree trunks
and burned most of
them off, formed a small
flow perhaps 1 m. deep
which subsided leaving
small tree molds with
sticks still in them, charred,
and some trees with
spatter in them up to
5 m. high.
(b+w photos @ end of roll.)
No vegetation.

On trail - Cuphea common
at lower end.
In middle part in
forest Paspalum conjugatum
Cyperus polystachyos &
Andropogon virginicus all along
No Andropogon glomeratum seen

Devil's Throat
ground shattered with
cracks formed on July 1,
when the Devil's Throat
pit enlarged. Cracks
both cross the area
and are concentric around
the pit which is about
30 m across and twice or
more times as deep.

Nov. 25 - Kilauea Iki Parking Area
End of board walk -
In the dead forest at
end of trail the vegetation
is closed - Holcus, Rubus ros.
Paspalum dilatatum, Commelina
diffusa, Cyperus polystachyos,
Hypochaeris radicata,
Sporobolus africana all
abundant. In area not
really much buried by
spatter. Buddleia asiatica
invading the new area,
large clumps. Only one
lehua with a living sprout
on right side of trail. Left
side vegetated farther along.
Eupatorium riparium at base
of tree.
Nephrolepis tufts in cracks
in bare area - very common.
At edge of ~~the~~ recovered
forest to left, Astelia n.

1961 Hawaiian Is.

Nov. 25 Glenwood
beyond M.P. 18
abundant. Buddleia
is most conspicuous
invader
Erechtites valerianifolia
and Conyza bonariensis
in shelter of trees also
Nephrolepis.
Last large plant in open
is Hypochaeris.
First platform.
Beyond this no plants on
right ex. a few tiny ferns
and one tiny Erechtites sheltered
by fallen tree.
Along trail - one Conyza
bon. in semi-open. 2 Pluchea
odorata in shelter of tree trunks.
One large clump of Dubautia
scabra (indicate ht.) one tiny one - both on
left. 1 Erechtites + 1
Buddleia on rt. in shelter
of trunks. Scattered tiny
Nephrolepis in ~~both~~ tiny
irregularities
Large clump of Eupatorium
+ several Dubautia rt. to left
Toward second platform
one Dubautia on rt, good clump
one clump of Eupatorium on
rt sheltered by tree trunks
Still a few tiny Nephrolepis
sheltered by trunks or in
tiny irregularities.

1 small Buddleia on left,
sheltered.
As cinders get smaller
the Nephrolepis disappears
except behind the tree trunks.
Second platform
Beyond for over 100 m. no
plants on rt. only a few
ferns + a Hypochaeris rosette
sheltered by trunks on left.
Then a very few Nephrolepis
sheltered on rt. more + larger
ones on left, but very scattered.
also Erechtites Photo.
From here on Nephrolepis
larger but not more
plentiful always in shelter
of tree trunks. A few Erechtites
Then, nearly to edge of
forest, a couple of large
sprawling Rubus penetrans,
Hypericum jap. around one
tree base. Buddleia Hypochaeris
On rt. a few Erechtites
Nephrolepis all sheltered by
trunks. One clump Dubautia
out a bit away from tree trunks
Almost at edge of forest
one Pteridium, 1 Litsphelia, 2
large patches of Coprosma ernod.
In edge of forest Coprosma.
Rubus penetrans are common.
Some Pteridium. Tree well
leafed out, dense column.
~~Photo~~ 1 also Rubus ros. + Vaccinium calycinum

photos

Photo

near parking lot

		~~Near parking lot~~	3975'	
		Nov. 25 - Kilauea Military Camp, Hawaii Volcanoes National Park. Weedy disturbed places on pyroclastic soil.	1210 m	
4	4463	Pyracantha spontaneous, established in		low, stiff, spreading bush, ripe fruit red, fleshy.
3	64	Lotus common in		prostrate, flowers yellow.
4	65	Crepsis lanceolata L. occasional in		heads bright orange-yellow.
6	66	Oenothera occasional		
1	67	Bidens filosa var. minor occasional in		rays white.
		Nov. 25 - on road between Thurston Lava Tube and Kilauea Iki, Hawaii Volcanoes National Park	3950' 1205 m	
4	68	Muehlenbeckia one plant seen climbing in tree beside road		Tangled vine, fruiting calyx white, fleshy.
		Nov. 25 - Puhimau Crater, Chain of Craters Road	3600' 1100 m	
	69	Vaccinium reticulatum Sm. common in open Metrosideros forest		shrub 0.8 m. tall; flowers and fruit red.
1	70	Metrosideros collina var. incana (Levl.) Rock	(tree #7)	small tree; this tree tagged to be observed to determine progress of disease of Metrosideros. (see p. 30-31)
1	71		(tree #8)	
2	72	Dominant tree in open scrub forest	(tree #10)	

Nov. 25 - Puhimau Crater -
Lehua seems to be dying over a large area just above P.C.
Marked trees on n. side ~~+ Radio~~ of road bet crater + road
1. Looks a bit poor, many dead twigs, dead back 4-5 ramifications.
2. Dead back from most tips, but healthy sprouts from trunk + branches.
3. More branches dead than alive - probably 3/4 ~ 4/5 of twigs leafless. Leaves blotched with red + black but mostly still green.
4 A few small branches dead. Living part not obviously sick but also not especially luxuriant.
5 Top dead, lower parts with some dead twigs but mostly healthy.
6. A few branchlets dead, rest of tree rather healthy looking. Many galls.
× 7 Top dead, ~~also~~ abundant sprouts at base and along trunk, some dead.

× 8 Only a very few dead twigs in top and in lower branches. Tree healthy looking.
9. Almost dead - few yellowish green or partly dried leaves.
× 10 Healthy small tree, flowering, only very few dead twigs.

typed ↓

Nov. 25 - about 1 mi. e. of Mountain View, in "Hawaiian Acres"
On broken, not very rough aa lava surface in grass, moist in low places.

44473 ~~8~~		Xyris complanata R.Br. common	leaves twisted. flowers bright yellow, 3 petals spreading horizontally. bulb fleshy
3	74	Xyris occasional	

Nov. 25 about 1 mi. toward Kilauea from Mountain View
In wet grassy disturbed place on broken lava clinkers.
~~rather~~

6	75	Xyris locally common	bulb fleshy, leaves somewhat twisted.
7	76	Xyris locally common	bulb fleshy, leaves somewhat twisted.
1	77	Xyris local	bulb fleshy, leaves somewhat twisted.
2	78	Rhynchospora occasional	

Nov. 25 - ~~near~~ just outside National Park on Volcano Road, Kilauea

2	79	Panicum in farm yard	plants decumbent, tangled.

Nov. 25 - upper end of Chain of Craters Road, Haw. Vol. Nat. Park

3	80	Chloris gayana local along road in edge of Metrosideros forest	erect clumps 1 - 1.5 m. tall.

1963 Hawaiian Is.

Nov. 25 - Kilauea Iki, Hawaii Volcanoes Nat. Park on 1959 pumice bed

44481 Vaccinium reticulatum
2 common

shrub 3-4 dm. tall, ~~corolla~~ leaves bright green; corolla ovoid, red with pale greenish tips; fruit yellowish red when ripe.

1 82 Vaccinium pahalae Skottsb.
rare

— dwarf shrub 3 dm. tall, leaves strongly reticulate and reticulate veined; sterile.

2 83 Dubautia
occasional

— dwarf shrub 3-4 dm. tall, much branched near base, heads white.

1963

Nov. 29 - flight from Haneda airport, Tokyo, to Hong Kong - DC-8, ~~at~~ left side over wing. Take-off 9:15 (Hong Kong Time)

Grass in vicinity of airport mostly brown. Yokohama is an ugly gray city.

Kii Peninsula badly obscured by clouds. The Japanese Alps in the distance to the right

9:27 and Fuji San, closer on the right, are magnificently snow-covered. Fuji is visible in distance on left but no detail in this light. Snow on Alps runs down ravines.

11:15 S. ~~K~~ peninsula of Kyushu, with Osumi Is. Visibility poor.

12:45 Taipei - but entirely obscured by clouds.

1:50 Flying up Hong Kong Gulf. On the left are several large islands that are brush covered except for terraced valley bottoms. The general color is green, certain slopes are brown, and ridge tops, especially on the mainland are bare and eroded. Whole hills in Kowloon are being removed to make building sites. Mainland browner than in July.

2:50 Left Hong Kong for Bangkok. Many small islets off New Territory mostly with cliffed coasts and

no habitation - thin brush where not too steep.

11:23 Clouds break somewhat and we cross a great river, probably the Mekong. But general visibility from this altitude is almost zero. A few hills, some apparent cultivation, show up on the west side of the river, but mostly one sees a blue haze with abundant scattered cumuli.

11:39 Sun is right to reflect from water - we seem to be flying over a marshy plain with little meandering streams and ponds, oxbows, and very irregular lakes. No detail of vegetation or relief clearly observable.

5:00 Weather a bit clearer. In distance ~~to~~ left large grasslands - brown, with gallery forests and small patches, sharply set off from the dark wooded hills closer by.

5:04 Crossed the first of Thailand's canals, running across the grassland, and soon this becomes orderly rice-land.

5:10 Near Bangkok a mosaic of rectangular brown and green fields. Canals (or river-channelized?) are lined with brown ones, backed by green.

Large areas east of river that are green rice fields, with no dwellings.

A bit north of this, all the dwellings are along alternate canals, making the canal banks almost a continuous village of houses surrounded by gardens and hedgerows.
Localized areas are truck farming instead of rice.
Where canals are not in rectangular arrangement the dwellings look scattered but are along these wandering canals. In places it is almost like gallery forest.
Westward the dwellings are scattered, with little reference to at least large canals.

Nov. 30 - Bogor -
Garden is in fair shape. 2 Romanian botanists have been there for 2 months. 2 Russian are stationed there.

Tithonia diversifolia abundant in hedges and roadsides.

Durians, rambutans, bananas are the most conspicuous fruits in the markets, but some mangosteens & mangoes. pineapples
pods of Parkia (?)
also ears of Maize & manihot roots.

Herbarium building - concrete piling being prepared now - 4 work 22 hours a day. Connection laid 2 months ago.
Specimens are now stored in the other old building and in 2 new temporary buildings
Mounting going on in old building spirit coll. also there.

Trent Laboratory - now Institute for Botanical Research -
Large semi-partitioned laboratory with really 3 laboratories in it - Tables scattered, ventilation by openings near

(over p. 42)

1963 Indonesia

Dec. 1 - Tugu to Bogor by car.

Tugu is rice terrace land, that in valley bottom still used for rice culture, that on slopes as sites for bungalows + gardens. Some of slopes still cult.

Ravine sides with a large bamboo.

Jak fruit, coconut, nuts, mango, bananas, papaya, Cupressus ~~and~~ Lagerstroemia speciosa, Malvaviscus, dead raisin, other ornamental trees + shrubs planted around houses. On way down.

Surrounding hills with some forest remaining near tops, grass on upper slopes.

Taro, manihot, maize, planted near houses, mostly rice elsewhere. Tithonia diversifolia common along roads. Sonchus leptocephalus occasional.

On way down Muntingia, Persea, guava, Pithecellobium dulce, Arundo donax, Caesalpinia pulcherrima, Plumeria rubra, Acalypha wilkesiana, Plumeria obtusifolia, Nerium indicum,

ornamental Hibiscus hybrids, Erythrina sp., Allamanda cathartica v. hendersonii, Hibiscus tiliaceus, Mangifera cf. caesulea, Artocarpus altilis, Gnetum gnemon, Aleurites moluccana, Crotalaria sp., Ceiba?, Helianthus annuus, Alocasia, Lebania grandiflora.

Gunung Salak is an almost perfect cone with the top blown out.

Imperata cylindrica is common but not seen as large dense stands, merely as a roadside weed.

H

top of 15-16 foot walls.
Very inefficient use of space, no possibility of temperature control.
Plumbing rather primitive (gas available on tables, but no vacuum!?)
Smaller buildings with somewhat the same sort of facilities. Chemical glassware OK for some work.
Gardens and greenhouses not in connection not at all satisfactory.
No possibility of controlled environments - Culture facilities very primitive & inadequate.
Work is mainly in phytochemistry, applied microbiology, & plant embryology.
Electric current unreliable

MISS WINARTI PARTANINGRAT
In charge of documentation MIPI

Lwalk is Paradoxurus hermaphroditus (Pallas) a Mustellid, shown in museum catching a bird, also eating papays. Eats coffee berries - seeds ~~avoided~~ and are considered the best coffee.

Trees - ornamentals
Salvia splendens
Salvia coccinea
Asparagus plumosus
Gerbera jamesonii
Euphorbia ~~sp~~ pulcherrima
Cyperus alternifolius
Impatiens sultana
Plumbago paniculata
Alternanthera versicolor
Pesine herbstii
Acalypha wilkesiana
Cyperus papyrus
Acacia farnesiana
Allamanda cathartica v. hendersonii
Pennisetum rupellii
Acalypha marginata
Pyrostegia venusta.

1963 Indonesia

Nov. 30 - tiff by car
Tugu to Bandung
Mountains have lower slopes cleared, mostly Tea plantations - bushes trimmed to about 1 m. tall, tops flat, trunks 5-8 cm. thick. Upper slopes and peaks mostly wooded.
Some scattered spindly shade trees in tea plantations but these certainly do not give much shade, at least in many places.
Imperata along roads.
Evidence of considerable erosion in some of tea plantations in form of exposed root systems.
Some ravines filled by Arundo donax. Broader ones with bananas.
Blechnum sp. on cut banks with young growth bright reddish.
Puntjak.
Miscanthus on steep places.
Much Cupressus, Pinus, and Araucaria planted around village of Puntjak.
Sambucus cf. mexicana.
Valley on other side is almost entirely in terraced rice.

Tjipanas
Slender spine like Agathis sp.
Cabbage, Sea mays, onions, mostly rice.
Most of rice seems to be in green fruit - some patches have been harvested and are flooded, but not many.
Much tall bamboos, Cocos, Mangifera, Artocarpus, Carica, Arenga, Mimusops, Garcinia, Eugenia cf. aquea,
Tjianjur
Coconuts become more and more abundant, on dikes between paddy fields, and around dwellings. Roads lined with Spondias (?) trees.
Many Carabao. Rice fields here have all or almost all been harvested and are fallow. Seedling beds ready to transplant. Some are already transplanted.
Most of what is for sale along road are drinking coconuts.
~~Then broad flat valley~~
Road cuts through an unconsolidated volcanic breccia with great size range.
Then broad flat valley bottom almost entirely in rice.

Not even bushes or weeds ~~but~~ or lianas.
But villages appear densely wooded - with bamboo, cocos, mango, breadfruit, jak, kindia, areca, etc.
Mostly on slightly higher ground.
~~Hills~~ Mts. in distance to rt. appear almost cleared to tops.
Dissected terraces, deep ravines - some teak plantation
steep places brushy.
Some Hevea plantation.
Then rather flat, more a less open rice country with abundant coconuts around villages.
Hilly country - with miscellaneous cultivation.
Hills or Mts. to right have what appears to be dead forest - maybe poisoned.
Road winds through foothills - some trees.
Elevation occasional.
Lagerstroemia speciosa.
Coming to what appears to be a range of limestone hills, largely denuded.
Lime kilns.
Areca, Cocos, more common

trees. Breadfruit, Ceiba, Cassia cf. spectabilis, Arenga, Muntingia
Much excavation, probably for limestone for kilns, in side of hills.
Lagerstroemia speciosa, both purple and pink forms, very common here.
The pattern of excavation is not clear. Possibly simply a matter of where easiest to dig.
Some evidence of Oryctes in coconut trees
Broad rather flat valley, mostly in rice.
Rolling enough so all is terraced.
A number of small cones on right, not too well preserved, partly terraced to summit.
Villages less thickly wooded.
Apparently we are in outskirts of Bandung.
Actually some miles out but building is almost continuous, at least along road.
Some very tall, columnar gnetum trees.

Bicycle ~~rickshaws~~ have mudguards very highly decorated and with names.

1963 Indonesia - Java

Dec. 4 - auto trip around Bandung.

Plants seen

Agathis loranthifolia
Cycas "rumphii"
Antigonon leptopus
Cocos nucifera
Thunbergia fragrans
Duranta repens
Ficus elastica
Psidium guajava
Persea americana
Pinus merkusii
Agave americana
Plumeria obtusifolia
Carica papaya
Agave cf. sisalana
Bougainvillea
Ixora cf. casei
Malvaviscus arboreus
Areca catechu
Euphorbia pulcherrima
Manihot esculenta
Codiaeum variegatum
Acalypha wilkesiana
Imperata cylindrica
Araucaria excelsa
Sambucus mexicana
Petrea volubilis
Bougainvillea cristata
Teloxma?

Hills above Bandung intensively cultivated wherever not occupied by dwellings.
At least along road, to 1000 m. dwellings are close together.
Much terraced land away from road.

Above 1000 m. dissection is rather extreme, the ash mantle is many m. deep.

Cinchona succirubra planted along edges of some fields near Lembang at 1150 m. Crops here are mainly temperate vegetables: maize, potatoes, onions, sweet potatoes, cabbage, cauliflower, peas, beans.

Still some rice.
Lantana common in hedge-rows.
Cupressus very common, said to be Mediterranean species. Looks like C. macrocarpa.

Pine plantations on upper slopes, but very poor looking.

Beyond gate slopes covered by very young pine plantations & some Cypathea, much Gleichenia, Melastoma, Pteridium, Eupatorium cf. odoratum, forming a shrub layer 1-2 m. tall. Above this a few pitiful remnants of forest. ~~Very~~ Very irregular, most trees partly dead.

H_2S odor very strong, some slight mixture of SO_2. Very local.

Gleichenia very abundant, ~~strongly~~ slightly rusty beneath.

Then scrub forest principally of Vaccinium. On a gray tuff.

1830 m. Tangkubanprahu Crater. Deep pit of gray ash. Tuff. no plants on middle & lower slopes. Mud-lake in bottom. (photos) steaming. Outer slopes at 1830 m. an open to closed Vaccinium scrub & scrub forest 4-5 m. tall, with solid ground layer of Polypodium feei. (photos)

The trees that are half dead are said to be damaged by sulphur fumes. Dilmy says that for 30 years the aspect has remained the same. Lower down, the depleted appearance results from war activities, much fighting here.

Some rather rattylooking rubber plantations.

Around the shoulder are extensive tea plantations with scattered very small shade trees. Thickets on very steep slopes and escarpments. The shade trees formerly here, Grevillea & Albizzia falcata, were said to cause such shade that they gave rise to "blister blight" of tea, so were cut down. The small trees now here are intended for shade, but less than before. Tjiater ~~Tjiat~~ area.

Tjiater Hot Sulphur Springs. water just tolerable. Some blue-green algae where water

1963 Indonesia - Java

has cooled slightly.
No peculiar vegetation, at least no longer. Completely modified.
Bamboo thickets on escarpments and slopes.
Acacia decurrens planted.
Tea plantations are trimmed to about 1 m. or less tall, flat topped, canopy

Bosscha Observatory.
Below this on way to Bandung frequent clumps and rows of Gigantochloa apus - with long pendulous tips like Bambusa tulda in India.
Arenga pinnata has many leaflets gone - said to be due to Oryctes rhinoceros.

Near Bandung Oryctes damage to coconuts quite noticeable

---

c Alternanthera ? sp
c Portulaca oleracea
o Amaranthus spinosus
o Sporobolus
n Eupatorium
c Commelina diffusa (m w)
o Dryopteris cordata

n cassia occidentalis
n cassia sp.
n Emilia sonchifolia

Tjiwidi 5 km from

Dec 7 - Bandung
weeds in roadside ditch in outskirts - from bank to water
o Myriophyllum brasiliense (w)
o Cyperus rotundus
o Thunbergia alata
o Elephantopus spicatus
n Impatiens sultani (m)
~~Lida acuta~~
o Hypoboma longiflora
c Euphorbia hirta
c Eleusine indica
c Hyptis spicigera
c Ludwigia cf. peruviana (w. m) fes 4 cm. diam.
c Amaranthus cf. tricolor
o Bidens pilosa v. minor
c Euphorbia prostrata
c Stachytarpheta (white fls, obtuse teeth, los. pub. beneath)
c Cynodon dactylon
c Cyperus cf. kyllingia
o Phyllanthus "niruri" (m)
c Axonopus ? (l. + m)
o Sporobolus cf. tiflorus
o Digitaria 2 spp.
o Paspalum conjugatum (m)
n Hedyotis corymbosa
~~Pityrogramma ??~~
o Fimbristylis "miliacea" (m)
o Oxalis corniculata
o Hyptis capitata
o Mimosa vaginalis (w)
o Lonicera pratula
o Commelina benghalensis

Ludwigia ? sp.
Lonicera ? sp.
Malvastrum coromandelianum
Solanum sp.
Urena cf. lobata
Spinosa sp. 2-7 pm. shine prickly
Lida rhombifolia
Atherpum occidentale ??
Polygonum sp.
Lepidella modiflora
Eclipta alba
Mimosa pudica
Sporobolus obscurus
Sporobolus indicus
Phenomenon sp. (w)
Paniceum sp.
Colocasia esculenta (m)
Oxalis sp.
Vernonia cinerea
Vegetation composite

all labels done (leads)

1963 Indonesia

PRAHU

Dec. 4 - Tankubanprahu Volcano, w. of Bandung — 1830 m.

tuff on tuff

on outer slopes of edge of crater

44484 × Vaccinium varingiaefolium (Bl.) Mig. — tree 4 m. tall; flowers red; fruit immature.

forming pure scrub forest

3 & 85 Polypodium feei (Borg) Mett. — fronds leathery, rhizome prostrate on surface of ground.

forming a dense ground layer in Vaccinium forest

TUGU BOGOR

Dec. 7 - Tugu, above Bogor

EVODIA RIDLEYI

3 86 Evodia ridleyi Hochr. — small tree × young growth conspicuously yellow-green, flowers white.

~~cultivated~~ planted in garden

Dec. 7 - Tjimindi, on road from Bandung to Djakarta, near Bandung — 2395' 740 m

~~in~~ roadside ditch

1 87 × Urena lobata L. ssp. lobata — suffrutescent herb, much branched, 1.5 m. tall, flowers rose pink.

rare on bank of

1 88 Digitaria

on bank of

1 89 × Axonopus compressus (Sw.) Beauv. — culms ascending

in mud in

1 90 × Eragrostis unioloides (Retz.) Nees

common on banks of

1 91 × Fimbristylis miliacea Vahl

in mud of

2 92 × Stachytarpheta australis Mold. — much branched herb, flowers nearly white.

common on banks of

1 93 Phyllanthus

in mud

1 94 Hedyotis corymbosa (L.) Lam.

rare in mud

to p. 60

Tjimindi

Dec 7 - 5 km from Bandung
trees & shrubs in yards
Persea americana
Artocarpus heterophyllus
Palaquium gapodilla
Carica papaya
Mangifera indica
Eugenia cf. aquea
Sambucus cf. mexicana (stem)
~~Kuget~~ Spathodea campanulata
Malvaviscus arboreus
Manihot esculenta
Psidium guajava
Musa sapientum
Punica granatum
Codiaeum variegatum
Citrus maxima
Polianthes tuberosa
Aster sp. cf. novebracensis
Rhoeo spathacea
Hibiscus schizopetalus
Anona muricata
Cupressus sp.
Antigonon leptopus
Rosa sp.
Thuja sp.?
Bambusa cf. glaucescens
Duranta cf. repens
fls bright purple, about 15 mm across
Euphorbia pulcherrima

The Polygonum has the calyx accrescent in fruit, strongly perigynous and very fleshy. dark color in inner layer of receptacle & lobes. Fls mature one at a time in inf.

Alocasia
Pedilanthus tithymaloides
Portulaca grandiflora
Plumeria rubra
Anona reticulata
Zebrina pendula
Rhaphidophora aurea
Cocos nucifera
Areca catechu

This area is a mosaic of wet rice, banana patches, mango, clumps of bamboo & trees around dwellings. Difference in elevation bet. rice and other fields about 2-4 m. Edges are small earth cliffs. Soil is a yellow brown, the surface 4-6 dm. dark to blackish.
Everything, mango, etc. are along road, much cut back.
Coconuts show some evidence of Oryctes damage. Coconut trees mostly seem quite old.
(Photos b&w & kod. of landscape & of carts & traffic on road.)
Carts have canvas tops which project forward to shade horse, too. Horses are very small. Wheels as high as or higher than horse.
The rice has just been harvested - some in distance not yet harvested.

1947 Indonesia

Dec. 7 - by car, Bandung to Tjibodas

Tjimindi

Tjimahi
Tithonia common
Nerium oleander
Euphorbia tirucalli
Parkia sp.
Agave sisalana & pineapple
Alcea rosea

Padalarang -
Land becomes more rolling, now predominantly rice cultur. terraced.

Beyond here some very rough limestone terrain. Mostly denuded.
Sharp crags and pinnacles. Limestone being quarried and baked.
Lagerstroemia speciosa common
Many lime kilns. Prob. reason for denudation - wood.
Hilly country beyond.
Some Hevea. Patches of Manihot.

Valley with terraced rice and abundant scattered houses and many coconut trees.

Gradually opens out into a rolling plain.
Mostly in rice terraces.
Some Hevea. Clumps of bamboo.
46 km. Crossed large muddy river.
Following deep river ravine cut in sediments that seem lateritized at top.
47 km. Flat valley, rice. Villages on sl. higher ground.
This continues for a good distance, then a large town, then a 'flow slope (?)' of towards Gedeh-Pangarango complex.
Ravine on this wooded with bamboo, Cocos, Aranga, Artocarpus, etc. Interplanted with rice, Musa, etc.

Patjet (1138 m) at head of this slope.

Tjimatjan (1088 m) - jct. of Tjibodas Rd.
Road to Tjibodas through misc. cultivation & villages.
Onions, maize, rice, tobacco, peas,

1963

44495		Oxalis corniculata L. rare on bank of	flowers yellow.
1	96	* Ipomoea ~~triflora~~ triloba L. occasional on bank of	flowers bright pink
1	97	Ludwigia peruviana (L.) Hara common in water and on banks	
1	98	* ~~Aphudia~~ mutica L. rare on banks of	
1	99	* Panicum repens L. in water and mud of	
1	500	Amaranthus. common on banks of	"bayum" eaten as a vegetable.
1	01	Dryopteris cordata (L.) Willd. rare on banks of	
1	02	Cyperus difformis Endl. common on banks of	dense tufts, heads white.
1	03	Solanum torvum Sw. occasional on banks of	shrub 1 m. tall, flowers
1	04	Polygonum chinense L. common on banks	scrambling suffruticose herb, flowers white, fruit with calyx greatly accrescent, perigynous, very fleshy, inner layers firm and black.
1	05	Emilia sonchifolia (L.) DC. rare on banks of	flowers purple, short
2	06	Digitaria common on banks of	
1	07	Ipomoea obscura Hassk. rare on banks of	flowers white
2	08	Euphorbia ~~prostrata~~ chamaesyce L. common on banks of	prostrate, purplish

1445	09	Digitaria rare on banks of	
1	10	Spermacoce suffruticosa Jacq. occasional on bank of	plant purplish; flowers white.
1	11	* ~~Panicum~~ Urochloa paspaloides Presl occasional on banks of	
1	12	Sporobolus cf. compressus Kunth common on banks of	in tufts
1	13	Alternanthera sessilis R. Br. common on banks of	prostrate
1	14	Eupatorium rare on banks of	flowers white, herbage with no odor.
		~~Dec. 7~~ - same place - in edges of rice field	
1	15	* (Chen.) Centipeda minima Br. + Arch. abundant	
1	16	Dentella repens (L.) Forst. occasional	prostrate, flowers white.
1	17	Dentella occasional	prostrate, flowers white.
		Dec. 8 - mouth of Tjiqenter, Ujong Kulon, west end of Java ~~in~~ thicket at top of beach	1 m.
4	18	Euphorbia chamaesyce Boiss. common in edges of	leaves pale beneath, glands yellowish but very small.
~~2~~	~~19~~	~~Premnitzera littorea~~ ~~common~~	
2	19	* Vitex ~~negundo~~ trifolia var. bicolor (Willd.) Mold. dominant in same - in clearing with a few trees	diffuse, much-branched shrub to 5 m. tall or more, flowers — ~~on~~
1	20	* Aerides odoratum Lour. common in trees (to p. 70)	Tangled stems; flowers fragrant, pale lavender, each segment marked with purple.

1963 Indonesia

Ujong Kulon - strict nature reserve since 1957 during which time clearing & bavoan banteng. nature park before

8:30 - 13:30 R. Tjigenter small island off. mouth

13:30 - back to ship

14:00 lunch

17:00 - 19:00 to ~~Tg. Tjpo~~ P. Peutjang

19:00 back to ship. over night

next day. to mainland off. P. Peutjang at Tjidjungkulan

AMS Java & Madura 1/50000 sheet 32/XXXIX - A & C
32/XXXVIII - D & 32/XXXIX - B & D

Prunyen I. = Panaitan I.

Handeulen I. - coral I.
veg. have been destroyed in center - to favor deer in 1939 - but deer have vanished.
In edges Pemphis, Hibiscus, Cycas.
In center open veg. Ardisia humilis
On edges - ~~Ardisia humilis~~ & beginnings of mangrove.
On edges Buchanania arborescens, Ficus,
(Kostermans)
Even Pemphis has lost leaves.

MSPI ship - Jalanidhi

Dec. 8 - Handeulan I.
Coastal vegetation largely leafless, new foliage just appearing. There has been a serious dry period for nearly 2 years. The coast opposite looks very much more dry.
Scattered Cordia subcordata at top of beach, bright green - new leaves.

On the uninhabited islet there is a tall forest on the north side of Tonnerator.

On inhabited one, on side toward other islet coastal veg. is mostly Pemphis.

Landed on inhabited islet
Sparse scrub forest of Pemphis with some Thespesia
- Guettarda.
Dysoxylum in trees.

Inland Excoecaria agallocha, Buchanania arborescens, Guettarda Ficus sp. Vitex sp. Rhizophora mucronata. Caparis - climber
Celtis growing at 15 m. x 4 cm. dbh. in clearing.
Undergrowth of Ardisia.

Desmodium, Acacia,
Ixora, Triplaris, Morinda,

In interior scrub
of Ardisia, Lantana,
Desmodium, etc.
crowding out the
Impenata that
dominated the clearing
after it was cleared.
Impenata [illegible] is
very open.
An old lagoon, now
dry, has been much dug
up by crabs which
form large mounds
of gravel
Along landward coast
there is a fringe of
Innerantia acida.
A few small Rhizophora.

The main body of
forest is a zone dominated
by Buchanania, with
Calophyllum, Ficus, Intsia,

Islets toward
Mainland is fringed
by mangrove swamp —
Rhizophora in front,
about 5-7 m. tall, then
Innerantia, more open,
behind, about 10-15 m.
Many of these islets.
No signs of drought on
these islets.
But mainland coast
looks almost like E.U.S.
in early spring, from a
distance — gray leafless
trees with here and there
a trace of light green.
Inland, of course, all is
green. Some sections of
coast, also, are green.
There are also bits of raised
reef, perhaps 1-2 m. above
water. Pandanus thicket
on one of these. Small Corypha.
some Pemphis and Terminalia.

Landed near mouth of
Tjigenter R. On small
bit of raised reef, where
there has been a fire — col.
land shells — subfossil
In open field — Curcuma
bracts rose purple.
Floral envelope — outer is
very thin, white. Inner firm and
rose color, staminode yellow, bright

Toward tip. Inside are two white subulate teeth hanging from roof - swollen and united at base.
Aeroles odorata common in trees.
Mangrove swamp -
Ardisia (edge)
Calophyllum "
Nipa
Premna "
Hibiscus tiliaceus
Ceriops
Avicennia alba
Aegiceras
Acrostichum

Cut to top of beach a thicket 4-5 m. tall of Vitex negundo with some Sophora tomentosa
Ipomoea on ground, also Vigna but not quite V. marina (sterile) and a little Ipomoea pes-caprae (capital).
Some Calophyllum shrubs. and Cycas ~~see~~ small plants.

Handeulen - uninhabited islet (photos of Tonneratia forest, some with Pemphis in front).

The cleared areas that provide food for the bantang and deer, pig, etc. are being seriously invaded by Eupatorium cf. odoratum. They try to get rid of it by cutting, but this does no good. The Andropogon and Panicum that form the food for the animals are being crowded out.

~~Mount~~ Pulu Pentjang - northwest corner is of elevated bedded limestone dipping perhaps northeast.

Coast opposite has stretches of reef that appears to be elevated about 1 m. and to be covered by soil. Small area of grass. Mostly densely forested.

1963 Indonesia

same – edge of mangrove swamp

4	4521	Lumnitzera littorea (Jack) Voigt common, growing with L. racemosa	0 m.	small tree, leaves leathery, flowers scarlet.
2	22	Lumnitzera racemosa Willd. common, growing with L. littorea		small tree, flowers white
2	23	Acanthus ilicifolius Linn. common		depressed shrub, — flowers bright purple.
2	24	Ceriops tagal		shrub 3 m. tall.
2	25	Ceriops occasional		

same – in open clearing

1	26	Curcuma ~~zedoaria~~ viridiflora Roxb. occasional		

Dec. 8 – Handeulen Island, Ujong Kulon, near west end of Java on coral limestone soil 1-2 m.

5	27	Diospyros maritima Bl. common in undergrowth		flowers cream-white
4	28	Ardisia humilis Vahl very common in undergrowth and invading clearing		shrub 4 m. tall, flowers rose pink.
3	29	Buchanania arborescens Bl. dominant in forest		slender ~~tall~~ suppressed tree (others to 30 m. tall) fruits not quite mature.
2	30	Eupatorium odoratum L. very common in edges of forest		herb to 2 m. tall, mostly dry and fruiting now, — flowers very pale lavender.
4	31	Excoecaria agallocha L. common in low dry lagoon		~~shrub~~ 3-4 m. tall. leaves new.
1	32	Leea ~~sambucina~~ indica Merr. occasional in forest		shrub 0.7 m. tall, flowers pale greenish.
3	33	Ximenia americana L. local in low spots in open vegetation		shrub 3 m. tall, ~~fl~~ leaves yellow green, flowers yellow, fruit green.

	44534	« Piper aduncum L. occasional in undergrowth		shrub to 4 m. tall
		Dec. 8 - Ujong Kulon, opposite Pulu Poetjang, near west end of Java in large clearing opened up to provide pasture for wild ungulates	2-3 m.	
1	35	« Tetracera scandens (L.) Merr. occasional		small sterile shrub
1	36	« Lantana camara L. var. aculeata (L.) Moldenke. common, invading		shrub less than 1 m. tall, flowers ~~a~~ yellow, turning red.
1	37	« Lantana camara L. var. aculeata (L.) Moldenke. common, invading		shrub less than 1 m. tall flowers yellowish turning pink.
2	38	« Melastoma polyanthum Bl. very common, invading		shrub 0.6 m. tall, flowers rose purple.
		Dec. 9 - Pulu Poetjang, near west end of Java, Ujong Kulon, dense tall forest on flat shallow coral soil	1 m	
10	39	Pisonia umbellifera (Forst.) Heim. rare tree in		broken tree about 7 m. tall, 4 dm. dbh. flowers dull whitish
5	40	Rinorea common in		understory tree or large shrub, arching habit, fruit immature.
		same - beach fringe	1 m	
3	41	« Ixora paludosa (Bl.) Kurz in forest just back of		
2	42	Scaevola taccada (Gaertn.) Roxb. occasional		shrub 1.5 m. tall (others seen to 4 m.), flowers white.
2	43	Sophora tomentosa L. common to abundant		shrub 2 m. tall (others seen to 5 m.).

1963 Indonesia

Dec. 7 - landed on mainland opposite Pulu Bentjang on a beautiful crescent beach of fine sand. Beach ridge covered by a thicket of Hibiscus tiliaceus and Sophora tomentosa, some Vitex negundo, Desmodium umbellatum.

On the other side of the mouth of the small stream is a small Nipa swamp with, back of it, some ~~[illegible]~~ Oncosperma palms.

The path to the look-out goes across this. The lookout is at the edge of a large pasture, cleared for the animals to graze in. This pasture is being seriously invaded by Lantana, Melastoma, locally Eupatorium, and Tetracera. This has been burned, so these bushes are small, but they are spaced at about 1 m.±. In many places there is almost nothing between them. In others only a thin very prostrate mixture, badly eaten off. Saw a small herd of bantang about

500 m. away. As long as the crowd were around the lookout even though they were being quiet, the bantang were alert, stationary, not eating. A little later, after the crowd had left, the animals were spread out, eating. A large wild boar was also seen.

The general vegetation around this area is a lowland rain forest. There are said to be 300 ha. cleared and about this much more in natural openings. Said to be between 400 x 500 head of bantang. These are said to degenerate if there is insufficient open space, though the animals are able to survive there.

Dec. 9 – Pulu Pentjang
belts of veg. acc. Kostermans
Calophyllum belt (on
sandy shore)
Barringtonia belt (on rocky shore)
Ficus belt
Mixed belt or area incendia.

Vegetation drier than to
be expected for climate –
many east Java trees.

Over populated with deer

Inner beach – a fringe
of Hibiscus tiliaceus and
Sophora tomentosa up
to 4-5 m. tall just at
top of beach outside
the Calophyllum.
Scaevola, Pandanus, Vitex,
Desmodium umbellatum
less common in this and
in edges of Calophyllum.
Beach locally fine
sand, locally finger gravel
Terminalia argentea rare
Guettarda speciosa rare

Inside the forest
nothing much on ground
but seedlings of trees
and Piper cf. fragilis

Between the Calophyllum
and Ficus, on very flat
land, is a broad belt
of "transition" forest, with
species of Pterospermum,
some Eugenia.
Very open beneath.

Ficus zone – many
large stranglers and
great buttressed trunks.
Large trees fairly
widely spaced. 10-50 m.
Scattered much smaller
trees between them. 3-5 m.
Almost no under-
~~trees~~ growth, but this
probably because of deer.
(tree 64 = Intsia bijuga)
large
tree 77 = Pisonia cf. umbellifera)
perhaps 4 dm dbh, 6-7 m. tall,
but prob. has been broken – yes
broken off when 2-3 dm. diam. at
about 5 m. ht.

A considerable number
of trees have been uprooted
recently, including some
numbered ones. All are very
shallow rooted, at least
so far as large roots
are concerned.

1963 Indonesia

Dec. 9 - trip by boat Ujong Kulon to Krakatau.

Prinzen I. The island, from the east, seems entirely forested. The forest shows varying degrees of leaflessness, and is generally brownish except for several stretches of terrace not much above sea-level, which are green, rather light, perhaps Calophyllum forest - the southernmost stretch shows conspicuous wind-shear and wind-groves.

The central mountain, said to be about 500 m. is densely wooded to the top. Kostermans says there is no water on the island.

Much of the shore vegetation is completely bare, but in places it is green.

Most of the trees, even the most brown ones, show a flush of pale green, as though they were putting forth young leaves.

Well to the north there appears to be a large indentation perhaps a km or more long, lined by an even green vegetation - possibly mangrove. Too far away to be sure.

Beaches are white, quite intermittent, also interrupted by what appears to be reefs that are very slightly elevated. No beach in front of the "mangrove" which makes it more likely that it is mangrove.

A rather flat-topped low mountain near the north end, back of the "mangrove" seems to have similar forest to that of the highest mt., also the ridge running south from it. To north the forest is rather ragged, some of it dark colored, probably Casuarina. Many leafless trees between the dark green ones. Beaches along most of the shore of this northern projection, apparently rather high beaches, white. Much Calophyllum forest back of beach.

The southern end of this island runs out into a series of jagged pinnacles and stacks.

Sebesi Island is a high cone behind Krakatau.

1963 Indonesia

Approaching Krakatau from just west of south. (photos - bkd. 2, b&w 2 to 3).
The crater in Anak K. is about half or one third the width of the island. Much steam or white smoke.
The clump of casuarina on the n.e. end of Anak seems to be still there and much taller than in 1958.
There are a number of white patches on the slopes.

On Krakatau proper the outer slopes are deeply gullied. Quite green. The coasts on the south side are lined by wave cut cliffs. (photos bkd. 1 & b&w, 1)
Lower slopes bright green, upper very dark. Cliffs gray except for some beach on side toward Anak - this is casuarina.
(more photos of new roll b&w)

Inner cliffs of west islet have sparse dry grass.

Great white billows of steam or smoke from crater. Low side of crater wall is on south side.

On main islet the peninsula projecting toward Anak is much drier and more sparsely vegetated than on outer slopes.

On Anak irregularities in the crater seem to be covered by bright yellow sulfur.
The south side seems to have been undercut and slumped off, exposing the very clear bedding of the ash.
From fairly close a scattering of light colored small plants can be seen on the slope above the clump of casuarina, also a fair sized casuarina some way toward the crater on this side.

Below lowest point in crater rim appear to be a lava flow that has spread out at the base of the slump slope, making a fan.

From the clump of casuarina wisps of grass are scattered perhaps half-way up the slope. Above that the light spots are probably rock.
Well developed grass around the clump and along the shore. At other corner is another sparser

clump of casuarina, most of which are apparently dead. Some grass there, too.

On north side, the upper 1/3 of the slope is thickly marked apparently by bombs.

Ashore —

list of plants

a	Spinifex squarrosus	x	m
o	Scaevola taccada	x	m
c	Ipomoea pes-caprae	xd	m
o	Crotalaria mucifera (+seedling)	x	s
	~~Vigna marina~~		
c	Canavalia rosea	xd	m
o	Pandanus tectorius (+seedling)	x	m
o	Calophyllum inophyllum		m
o	Pongamia pinnata	xd	m
o	Barringtonia asiatica	x	s
ac	Schoenus muticum	xd	m
o	Morinda citrifolia	xdd	m-m
	~~Sebaeanum maticum~~		
lc	Casuarina equisetifolia	xd	m
o	Premna obtusifolia	x	m
a	Ipomoea cf. littoralis	x	m
o	Remirea maritima	xd	m
a	Fimbristylis cymosa	xd	m
a	Cyperus javanicus	x	m
a	Cassytha filiformis	xdd	m
a	Hibiscus tiliaceus	x	m
a-c	Saccharum spontaneum	x	m
o	Terminalia catappa	x	m
o	Eupatorium cf. odoratum	d	m

Cyperus cf. variegatus x
Desmodium umbellatum x
Imperata cylindrica x

Crab holes up on slope 300 m from sea. Dead grasshopper seen even farther up.

Splatter bombs of aa as much as 1.5 m.+ across are down fully 2/3 the way from crater to shore, smaller ones farther. They get more abundant nearer top until well below rim they cover all the slope.

Inside crater are white beds. A complex mess of cones and vents brightly stained with sulfur inside crater. A flow running down along side these cones and spilling over the edge to the south.

The outside of the crater is scattered with fragments of various rocks, in addition to the splatter bombs. There are a few enormous fusiform bombs (photos), but mostly broken ~~rocks~~ dense porphyry, some bright yellowish pieces, several colors of scoria, some fine pumice rather low on slope.

Some shallow gully erosion evident. Climbed only the north

slope and down to n.w. corner.

Except for abundant small sterile tufts of Saccharum and a very few scattered Casuarina which run up the slopes of ash and cinders, the entire vegetation is on the cinder a volcanic sand flats at the ~~north base~~ of the cone. Here there are low thickets of Casuarina with a few other shrubs, ~~and~~ patches of tall Saccharum spontaneum, patches of Ischaemum sod, large mats of Ipomoea per-caprae and Canavallia have been repeatedly almost killed some of the Casuarina are ~~dead~~ dead or apparently so. Wrinda is mostly dead and Calophyllum also. Cassytha mostly dead. Ischaemum leaves are mostly dead, ~~but~~ rest of plant still green.

Dec 18 - ~~road~~ from Djakarta to Bogor.

Rubber trees definitely leaning in one direction.

Many durian for sale. also rambutan ~~mangosteen~~ Ochroma pyramidalis Ipomoea ~~aquat~~ fistulosa Tagetes

Country is all cult. mostly in small ~~fields~~ patches! Planted trees between, in special patches and around dwellings.

Dec. 9 - Anak Krakatau, Krakatau Is., Sunda Strait on flat of cinders and volcanic sand, ash at base of cinder cone.

4	44	Canavalia rosea (Sw.) DC. very common	1-3 m.	prostrate vine, older vines dead, half buried by sand.
4	45	Cassytha filiformis L. abundant		forming a drapery over other plants and ground
3	46	Morinda citrifolia L. occasional		mostly dead (from drought?). shrubs to 1 m. tall, mostly dead (from drought?).
4	47	Spinifex littoreus Merr. occasional on open beach		small tufts, rather glaucous green.
3	48	Ipomoea pes caprae (L.) Sweet common		prostrate vine.
1	49	Pandanus tectorius Park. only a few plants seen		shrub 1.5 m. tall, sterile.
2	50	Remirea maritima Aubl. very local in sand		loose clumps, partially buried
4	51	Ischaemum muticum L. very common, forming loose mat locally		prostrate with ascending branches.
2	52	Cyperus javanicus Houtt. rare, one tuft seen		caespitose
3	53	Fimbristylis cymosa R.Br. rare, one tuft seen		caespitose
?	54	Eupatorium odoratum L. occasional		herb 1 m. tall, all seen dead
3	55	Imperata cylindrica Beauv. rare, one tiny patch seen		
2	56	Saccharum spontaneum L. var. commonest plant on island, mature plants on flats, smaller ones on cinder slopes.	Wagha Hack.	caespitose, culms 3 m. tall.

44557		Ipomoea cf. littoralis Bl. rare, one plant in thicket	sterile twiner.
1	58	Premna obtusifolia R. Br. occasional	shrub 1.5 m. tall
3	59	Desmodium umbellatum DC. occasional	shrub 1-1.5 m. tall, sterile.
2	60	Erythrina cf. variegata Linn. rare, one plant seen	shrub 0.8 m. tall, sterile.
1	61	× Clerodendrum inerme (L.) Gaertn. ? rare, one plant seen	sterile
3	62	Casuarina equisetifolia L. common, forming small patches isolated plants spreading up slopes from	small tree, 5 m. tall.
2	63	Terminalia catappa L. occasional	shrub 1 m. tall; sterile.
2	64	Hibiscus tiliaceus Linn. rare	shrub 1.5 m. tall, sterile; leaves green beneath.
2	65	Pongamia pinnata (L.) Pierre occasional	shrubs 1-1.5 m. tall, sterile.
3	66	Calophyllum inophyllum L. occasional, mostly dead (from drought ?)	shrubs to 1.5 m. tall, sterile.
2	67	Barringtonia asiatica (L.) Kurz rare, seedlings only	
3	68	Scaevola taccada (Gaertn.) Roxb. occasional	shrub 1 m. tall, fruits immature

1963 Indonesia

Dec. 11 - trip to Tjibodas

Eupatorium pallescens very abundant along roads below Tjibodas.
Imperata common along roads in tea plantations, a small Andropogon on vertical banks & cuts.
Tjimajan -
Asparagus plumosus cult.
Portulaca oleracea (weed)
Helianthus annuus.
Bruspelsia (purple & white)

From Tjibodas the Gelek trail climbs through tall montane rain forest.
The first hundred m. or so has huge altingia excelsa trees 30 m. or more, the forest not well separated into layers. Shrubs rather abundant. Many epiphytes.
About 1500 m. Podocarpus imbricatus makes its appearance and Altingia disappears. Podocarpus becomes most common upward, but does not become dominant.
The forest gradually gets lower upward, but even to 1900 m. there are

still large Podocarpus trees. These have sparse foliage, but the branches bear huge masses of bryophytes and other epiphytes.
This forest is not very well distinguished into a montane rain forest and cloud forest zones. The stature tends to become lower and the epiphytes more abundant, but there is no good boundary.
At about 1900 m. there is an area of very open forest with many epiphytes and plants of higher altitudes, e.g. Polypodium feei, Gaultheria spp. growing on ground between small rather beaten-up looking trees. This is the site of a great volcanic mud flow that followed the 1955 eruption. A stream was dammed by ash and debris, then this dam broke, releasing the lake behind it. It practically destroyed the forest for a long distance down-hill.

(to p. 98)

1963 Indonesia

Dec. 11 - Trail up Gedeh Volcano from Tjibodas in thick montane rain forest

44569		~~Macropanax~~ Schefflera polybotrya (Bl.) Miq.	1500 m± ↓ shrub 3 m. tall
2		occasional	
5	70	Disporum chinense Don. common	herb to 1 m. tall, flowers pendent, red; fruit bluish black.
2	71	Turpinia pomifera (Roxb.) DC. occasional in undergrowth	shrub 2.5 m. tall, aromatic when crushed.
1	72	Podocarpus imbricatus Bl. occasional at this altitude	twig from ground under 25-30 m. tree.
1	73	Impatiens javensis Miq. occasional along path	flower rose pink.
2	74	Ficus sinuata ssp. cuspidata (Reinw.) Corner occasional in undergrowth	slender shrub 3 m. tall,
2	75	Cyrtandra picta Bl. common locally on ground	lips yellow.
2	76	Dianella ~~montana~~ nemorosa Lam. rare.	semi-shrub, stems green, flowers white.
2	77	Ardisia fuliginosa Bl. common	erect herb 1.5-2 m. tall, arching at tips, fruit immature.
2	78	Vaccinium lucidum Miq. epiphytic	tall shrub, 4 m. tall, inflorescences reddish, corollas white, turning pinkish.
1	79	Curculigo capitata (Lam.) O. Ktze common along trail	from large epiphytic shrub fallen to ground, ripe fruit black.
5	80	Glochidion rubrum Bl. common in undergrowth.	1600 m± ↓ flowers yellow.
1	81	Arisaema filiforme Bl. occasional	large shrub, fruit pinkish aril red.
1	82	Arisaema filiforme Bl. occasional	probably same as #44582.
			~~of~~ leaflets, spathe very dark purple, spadix appendage pendent green, tube purple within.

1963 Indonesia

44583 Solanum
1 occasional along trail

1 84 Polygala venenosa Jus.
rare on ground

1 85 Viola
common in trail

1 86 Dendrobium mutabile Lindl.
epiphytic on shrubs

1 87 (orchid)
specimen awol
epiphytic on log

5 88 Lasianthus tomentosus Bl.
occasional in undergrowth

6 89 Lasianthus lucidus Bl.
occasional in undergrowth

3 90 ~~Acanthopanax~~ Schefflera aromatica (Bl.) H.
occasional in undergrowth

1 91 Impatiens javanensis Miq.
very common along trail

2 92 Ophiorhiza longiflora Bl.
occasional along trail

1 93 Dichroa febrifuga Lour.
creeper on fallen tree

5 94 Nertera granadensis (L.f.) Druce
along trail in open place

5 95 Pernettia alpestris (Bl.) Loes.
in undergrowth

3 96 ~~Pratia~~ Lobelia angulata Forst.
in open place along trail

3 97 Nertera granadensis (L.f.) Druce
in open beat on mud-bloco

herb, 1 m. tall, flowers pale purplish, fruiting pedicels strongly curved.
— unbranched shrub 0.3 m. tall, flowers deep red-purple.
— flowers white.

PLANTS OF INDONESIA
JAVA

Locality Trail up Gedeh Volcano from Tjibodas
Occurrence Epiphytic on log in thick montane rain forest
Date Dec. 11, 1963 Alt. 1600 ± m
Coll. F. R. Fosberg No. 44587
Remarks Flowers deep orange red

nge red.

ll; ~~flowers~~ corolla
and purplish lobes.
ll,
e.
ll, aromatic
ers green.
lavender,
deep red center.
ish white.

fruit
e, fleshy.

1750 m forming loose mat several m. across; stems reddish. leaves conspicuously
— venulose above; fruit orange, rare.
large shrub, 3-4 m. tall;
— fruit dark red.
prostrate, forming loose mat;
— fruit purple, fleshy.
1900 m. prostrate, forming mat, fruit orange.

PLANTS OF INDONESIA

JAVA

Locality Trail up Gedeh Volcano from Tjibodas

Occurrence Epiphytic on log in thick montane rain forest

Date Dec. 11, 1963 Alt. 1600 ± m

Coll. F. R. Fosberg No. 44587

Remarks Flowers deep orange red

1963 Indonesia

44583		Solanum occasional along trail	herb, 1 m. tall, flower pale purplish, fruiting pedicels strongly curved.
1	84	Polygala venenosa Jun. rare on ground	unbranched shrub 0.3 m. tall, flowers deep red-purple.
1	85	Viola common in trail	flowers white.
1	86	Dendrobium mutabile Lindl. epiphytic on shrubs	flowers white.
1	87	(orchid) epiphytic on log	flowers deep orange red.
5	88	Lasianthus tomentosus Bl. occasional in undergrowth	1600-1700 m. shrub 2 m. tall; ~~flowers~~ corolla with white tube and purplish lobes.
6	89	Lasianthus lucidus Bl. occasional in undergrowth	shrub 2 m. tall, flowers white.
3	90	~~Macropanax~~ Schefflera aromatica (Bl.) Harms occasional in undergrowth	shrub 3 m. tall, aromatic when broken; flowers green.
1	91	Impatiens javanensis Miq. very common along trail	flowers very pale lavender, almost white, with a deep red center.
2	92	Ophiorhiza longiflora Bl. occasional along trail	flowers pinkish white.
1	93	Dichroa febrifuga Lour. creeper on fallen tree	branches erect; fruit bright deep blue, fleshy.
5	94	Nertera granadensis (L.f.) Druce along trail in open place	1750 m. forming loose mat several m. across; stems reddish. leaves conspicuously venulose above; fruit orange red.
5	95	Pernettia alpestris (Bl.) Loes. in undergrowth	large shrub, 3-4 m. tall; fruit dark red.
3	96	~~Pratia~~ Lobelia angulata Forst. in open place along trail	prostrate, forming loose mat; fruit purple, fleshy.
3	97	Nertera granadensis (L.f.) Druce in open beset on mud-bloco	1900 m. prostrate, forming mat, fruit orange.

same - saddle between
Gedeh and Pangarango Volcanoes
~~44598~~ in low mossy montane forest
44598 × Blechnum capense Schl.
2 common ~~on~~ in semi-open place
2 99 × ~~Blechnum~~ Pleagiogyria glauca (Bl.) Mett.
common in rather
open
600 ~~Sphenomeris~~ Sedrytis?
6 very local in open place
along trail
3 01 × Carex rafflesia Boott
occasional in open
places along trail
2 02 × Eupatorium ~~speciosum~~ riparium Regel
abundant along trail

2 03 × Polygonum paniculatum Bl.
occasional in open
places along trail

. Dec. 12 - same
2 04 × Isachne ~~cf. pangarangensis~~ albens Trin.
common along trail
2 05 Dichroa febrifuga Lam.
occasional in
3 06 × ~~Isatia~~ Lobelia montana Reinw. ex Bl.
occasional in
1 07 × Lycopodium ~~sp.~~ ~~serratum~~ serratum Thunb.
occasional on mossy banks in
1 08 × Grammitis fasciatum (Bl.)
occasional on mossy tree trunks
1 09 × Asplenium laserpitiifolium Lam.
rare on mossy tree trunks

2400 m.
↓
in young growth reddish
plant sterile, mature
— fronds green beneath.
fronds white beneath,
young growth green; sterile.
— much branched
shrub, 1 m. tall; flowers
white.
— caespitose, culms
ascending.

sprawling suffruticent
herb, spreading by
rhizomes; flowers white.

caespitose, stems 1-1.5
m. tall, flowers white,
fruits black fleshy,
fruiting stems leafless.

erect shrub 0.8 m. tall;
flowers blue, buds white.
— sprawling herb, up to
1 m. long, fruit deep purple,
fleshy.
erect

(to p. 102)

above this, the trail climbs a steep slope up to the rim of an old crater. The forest is now very low, perhaps no more than 8-10 m. tall, with few intermediate trees, very mossy. Perhaps a true mossy forest or cloud forest. Albizia montana comes in here, rather sparsely. The MIPI hut is being constructed here. Two good sized albizia, perhaps 7-8 m or more tall are at the edge of the clearing. There has been considerable disturbance, especially along the trail.

Two large cupressus trees remain from a mountain garden established 30 years ago by Teysmann.

The hut will be a very comfortable structure in which a number of people can live and work.

From the saddle upward the forest is a single stratum of trees about 8-10 m tall. the largest are Vaccinium varingifolium, largest seen 1.5+ m. greatest d.b.h. Many ferns and much moss.

This gets smaller and more and more trees broken off by the 1955 eruption. Near the crater rim it is a low scrub forest with most larger trees broken off. Mostly vaccinium varingifolium (Photos - b & w. end roll. Pangrango clear.) Anaphalis common also Dianella Gaiania Gaultheria, albizia montana.

At rim the ~~to~~ vegetation is an open Vaccinium scrub 1-1.5 m. tall with old stubs to 3-4 m.

Almost nothing except tufts of Dracine pangrangensis Anaphalis, Polypodium feei, & Vaccinium on bare inner slopes.

Photos of view. Pangrango crater, limestone outc. - b & w roll

veg.

1963 Indonesia

Up along the crater rim the scrub rapidly decreases to about 0.5 m. tall, pure Vaccinium. Then it retreats to varying distances from the rim, leaving a bare strip with a few tufts of Carex and Histiopteris.

At summit the scrub comes almost to the rim again. It is open with a few tufts of Carex, Galium, Polygonum and Histiopteris between the bushes. The soil is a gravel of broken rock from sand size to huge boulders.

Below, to east, between this and next peak, the bottom of the valley has been burned out forming a long bare strip, the edges being colonized by Anaphalis.

This whole crater rim and inside was said to have been ~~forested~~ open scrub before the 1955 eruption. Burned off to stubs, from which the present scrub has sprouted. In bare area the

Vaccinium was killed.

Dec. 12 – slopes of Gedeh Volcano immediately above ~~saddle~~ Gedeh-Pangrango Saddle

in low mossy forest

4	4	(ind.) Hedyotis occasional along trail	herb a suffrutescent herb 1–1.5 m. tall.
2	11	Asplenium setisectum Bl. low on mossy ~~to~~ tree trunks	culms low arching, weak.
3	12 K	Carex longibracteata Stend. common along trail	
1	13 K	Humata alpina Moore occasional, epiphytic, this specimen from a fallen branch	
2	14	Podocarpus imbricatus Bl. occasional	juvenile foliage, from a seedling 1 m. tall.
1	15 K	Blechnum patersonii Mett. common along trail	fertile fronds dead, no sign of red in young growth.
2	16 K	Myriactis javanica (Bl.) DC. very common along trail	sprawling herb. rays white, disk green.
1	17 K	Schefflera ~~adorata~~ lucescens Kdy. occasional in undergrowth	woody climber
5	18 K	Myrica javanica Bl. rare	tree 6 m. tall; fruits turning red.
	~~17~~	same, on steep slopes with low forest damaged by 1955 eruption, rather open	
2	19	Dianella javanica (Bl.) Kth. common	forming large clumps 1.5–2 m. tall; fruits all gone. leaves glaucous beneath.
2	20 K	~~Gentiana~~ Swertia javanica Bl. local	all plants dead, apparently annual.
2	21 K	Gaultheria nummularioides Don common	creeping, corolla white, fruit black.

2450–2550 m

2600–2800

1963 Indonesia

44622	K	Eurya obovata Koth. occasional	
1	23	K Gaultheria ~~paspanicum~~ punctata Bl. occasional	
3	24	K Gaultheria leucocarpa Bl. f. scandens Hochr. common	
2	25	Gahnia f. tristis Nees common	
3	26	K Symplocos spicata Roxb. occasional	
10	27	Albizia montana Benth. locally abundant, common generally	
2	28	Anaphalis javanica Sch. very common in openings	Bip.
4	29	Albizia montana Benth. locally abundant common generally	
1	30	Albizia montana Benth. seedlings in mineral soil	of trail.
3	31	Nertera granadensis (L.) Druce common on soil	
1	32	K Rhododendron retusum Benn. occasional	

shrub 2 m. tall
— corollas dull white
erect, strong
wintergreen odor when broken
— shrub with rather
scrambling branchlets,
fruit white, fleshy;
herbage with wintergreen
— odor when broken.
forming clumps,
panicles drooping.
— shrub 1 m. tall;
flowers white.
— shrub or small tree
4 m. tall, in bud, bracts
very soon caducous,
well before flowers open.
spikes solitary and
in pairs in leaf axils.
galls very common and
conspicuous.
— much branched rounded
shrub to 1 m. tall.
— shrub 3 m. tall (but
trees seen to 8 or 10 m., + 15 cm dbh.)
buds only. spikes single
in axils.

prostrate

shrub; flowers vermillion.

Dec. 12 – on and near summit of Gedeh Volcano
~~in~~ open Vaccinium scrub on

44633 Vaccinium varingiifolium (Bl.) Miq.
6 dominant in

~~34 Gaultheria~~

1 34 × Gaultheria leucocarpa Bl. f. scandens
rare in

2 35 Albizia montana Benth.
rare, one plant seen in this high scrub.

3 36 Polygonum chinense L.
common in upper edges of

2 37 × Vaccinium varingiifolium (Bl.) Miq.
dominant in

3 38 Histiopteris incisa (Thunb.) J. Sm.
scattered in scrub
also in open

3 39 × Carex hypsophylla Miq.
common in

2 40 × Carex hypsophylla Miq.
common in edge of

2 41 × Carex hypsophylla Miq.
common in open ground
on volcanic ejecta

Dec. 12 Slopes of Volcan Gedeh
below ~~saddle~~ Gedeh-Pangarango saddle.
toward Tjibodas
~~in~~ thick mossy montane rain forest

4 42 × ~~Pratia~~ Lobelia montana Reinw. ex Bl.
occasional

2 43 Nertera granadensis (L.f.) Druce
on bank beside trail

2400 m.

Lava volcanic ejecta
shrub 1 m. tall, fruits mostly immature, black and sweet when ripe.
young growth reddish.

Hodin. shrub; fruit white.

shrub 1.5 m. tall; leaves purplish; one or two spike in a leaf axil.

prostrate, branched herb, flowers white, fruit black, fleshy.

shrub 0.7 m. tall; corollas dark red, with faint honeyodor; berries blue-black, sweet.

depressed half dead plants.

tufts, culms spreading, arching.

spreading tufts

tufts

2300-2350 m.

sprawling herb, flowers violet; fruit black, fleshy.

prostrate, fruit red (fls.)

44644		Gaultheria leucocarpa (Bl.) f. scandens ~~occasional on~~ common on volcanic mud-flow	1900 m. Hoch. — shrub 2 m. tall, branchlets pendulous, fruit white; leaves ~~[illegible]~~ with wintergreen odor when broken.
2	45	Dichroa febrifuga Lam. occasional on ground	2300 m. — erect, 1 m. tall, buds pale, flowers blue.
1	46	× Hymenophyllum junghuhnii V. d. B. on vertical bank above trail	2300 m.
5	47	Nertera granadensis (L.f.) Druce common on volcanic mud flow in open vegetation	1900 m ↓ prostrate; leaves crispate, venulose; fruit red. (fls.)
6	48	× Gaultheria ~~fragrantissima~~ punctata Bl. common on volcanic mud flow	
2	49	× (orch.) Bulbophyllum g. ovalifolium (Bl.) Lindl. ~~[illegible]~~ on fallen mossy branch	buds bronze color.
2	50	× Belvisia revoluta (Bl.) Copel. on mossy stump	
		Dec. 12 - forest just above Tjibodas in tall montane rain forest	1550 m.
2	51	Datura suaveolens H.+B. naturalized along trail in	shrub 3 m. tall; corollas white, pendent.
6	52	× Turpinia montana (Bl.) Kurz rare in	shrub 4 m. tall.

1967

Dec. 14 - airtrip Djakarta - Tokyo
Riouw Archipelago.

Views of ~~the~~ these islands showed a general pattern of wooded hills, lower slopes and flatter areas cultivated, mostly shifting agriculture, and the valley bottoms swampy - nipa and mangrove. The whole presents the appearance of a drowned area, with tidal swamps in all inlets and valley mouths, and tidal streams in them that seem disproportionately large for the size of the area drained.

The islands on the east side of the mouth of the Gulf of Siam are predominantly wooded. The mainland east of the Gulf is a vast intensively cultivated plain with scattered small hills, mountains and ranges protruding up through it. These seem to be predominantly wooded. Farther up, along the coast, are several small islands that have little wood left. Around the head of the Gulf, in the east

corner is a border of mangrove swamp, inland from which is the vast open, at this season, ~~too~~ tawny plain, ~~the~~ cut into a gridiron by "gallery forest" along canals and rivers; in reality these "forest" strips are continuous villages.

Hong Kong - the hills of Kowloon, ~~[illegible]~~ almost completely denuded, are now brown, with scarcely any tinge of green. Hong Kong Island is still rather green.

Dec. 14 - Hanauma Bay

Counted 100 kiawe
21 of them spineless.

on windswept hill to ~~at~~
left of bay ~~at~~ at end of
parking lot.

Flats beyond Blowhole
counted 100 kiawe
21 of them spineless.

Beyond Makapuu Beach Park
counted 50 kiawe tree
22 of them spineless

1963 Calif. - Nev.

Dec. 17 - air trip San Francisco to Washington (rt. side DC 8.)
Snow extends well down around the foothills, but does not seem to be excessively heavy.
Route is ~~[illegible]~~ Yosemite, Mono Lake, Grand Jct. Colo., Denver, Columbus, Washington, acc. Capt.
Mono Lake, on rt. has considerable water. A valley just east of it, with either a lake or a dry lake in the distance to south, has a n.-s. road. East of it a range with some snow.
Next valley also, has a road and some ranches.
Then ranges become less regularly n.-s. A substantial area to east has no very obvious development except a rather faint road in ~~the~~ the first valley (n.-s.) Several dry lakes - the first one very large. East of the next one a n.-s. road that seems rather well marked.
Then a very striking dry lake, not very long, though. Area of dunes to east of it.
Then a large valley with several dry lakes and also

(speed said by capt. to be just under 600 mph.)

several roads at angles to each other and to course.
East of this valley a curved range with a lot of small hills and very curious "blow-out" like areas on their sides and base - the west of range. A little snow on range. "Blow-out" could be a fine dusting of snow, but does not seem likely.
Next valley no very obvious road.
Next range - a powdering of snow on lower slopes - perhaps same as the noted above.
Dry lake and faint road in next valley. Yes, the dusting seems to be snow in next range.
No very obvious road in next valley, but a rather clear one in next.
In next a very curious fan-shaped drainage pattern looking like a dry lake cut by erosion. A road up one finger of it, to a small pond.
Next valley has a large dry water-course in bottom (n.-s.) and apparently a

couple of buildings - not clear though, and no road.
Next valley has a dry water-course leading to a "dry" lake with a bit of water in it, to south, several roads and an artificial pond. A road from this over mts. to next valley which has a number of roads and an air strip, prob. also a railroad. This valley quite large.
Country becomes more mountainous, some cultivation in small valleys. Then a large valley with some large-scale cultivation ~~Then~~ or at least clearing - large angular patches.
More to east of this.
Large road stretching southward and sl. east.
Then an extensive valley or plain but with some roads. Very light snow on much of this country.
Then a town, some cultivation, road and mountainous area to east of it.
Then, at about 10:30, visibility becomes bad. For a short time.
10:34 Country is now much more mountainous, also much more snowy. High mountains,

probably in Utah.
More bad visibility.
A short period of better visibility reveals a large valley cut by tributary streams, quite snowy.
Then more clouds.
Then a very extensive valley with a large dry or nearly dry ~~stream~~ river system running generally southeast and, northeast of it, a large reddish desert area with several mesas in centes of it, a road about along some, but generally little disturbance.
General structural line crossing this generally n.e.-s.w.
Striking mesa and canyon country to s.e. of it - a deeply incised river system in a generally flat plain, quite extensive, with a very rugged snow-covered range or chunk of peaks to east of it, separated, however, by a sharp n.w.-s.e. east-facing scarp and a rather narrow valley. A long snowy range in distance to east a southeast. Much rather

rough mesa - canyon
country between.
North of the long snowy
area is another snowy
range (Prof. Warstich?) (10:55)
Behind a broad valley
with, on its west side
a long slope cut by parallel
canyons running somewhat
north of east down to a
generally n.w.-s.e. trending
valley bottom. E. of this a
long slope then a conspicuous
scarp topped by rim-rock,
and two extensive flat
mesas, covered by snow,
this unbroken except by some
clumps & small areas of
trees to eastward, where
the mesas merge into
a rough park-land mosaic.
A couple of well marked
n.w.-s.e. roads & rail-roads.
Large area of mostly conifer
forest. More rather rough
valley country, with some
roads. Then really
rough snowy mts.
very extensive - but
visibility getting worse
and worse. (11:02).
This must be the area east
of Grand Junction. What
appears to be Pikes Peak is in

the far distance somewhat
to south of course.
A n.w. running valley
with roads, r.r. etc.
crosses course at 11:05, then
another. The surrounding
mountains are rugged and
snow-covered.
Pike's Peak is well separated
from the main mountain
system by a broad flat
valley with only minor
ridges. Much area
above timber-line in the
eastern ranges ~~of this~~ pretty
of the ~~front range~~ valley.
Continental divide 11:11.
Ranges east of the valley
n.w. of Pike Peak, and
more & less running
into it, do not have
much snow. Some of
them have rather extensive
areas above timber-line.
High plains east of
Front Range are snowy.
Area immediately along
and under course is very
much divided up - cultivated
& subdivided - prob. outskirts
of Denver. (11:18)
Rather light snow about
as far as one can see.

1963 Virginia

Dec. 29 - Belvedere Farm, Rappahannock R. below Fredericksburg
Portion between the two roads - Ravine about 8-10 m. deep along creek with forest of large tulip and Platanus with smaller oaks, beech, Carpinus, Liquidambar, etc.
Bottom of ravine flat. Creek with some water and pools.
Sides of ravine with larger trees, some Lonicera japonica, abundant Polystichum acrostichoides, Asplenium Platyneuron, much Ilex opaca.
Rhus toxicodendron - large vine on tree trunk.

Some photos of this area b&w + clrd.

Crows heard.
Rabbit tracks in snow.
— Flood plain —
Ring billed gull on river.

Fair sized flocks of redwing + rusty blackbirds in trees along river - many hundreds of birds.
+ evening grosbeaks. crows
Photos across river and in beaver pond.

Celtis common on escarpment - one very large tree seen.
Flexopaca also common
Liquidambar - large trees.
Ilex in places forms a conspicuous part of the understory.
Most of fruits of Liquidambar have dropped, but seem to vary from tree to tree, some entirely dropped, others still hold many fruits.
Platanus fruits still hanging.

A small patch of pine + cedar just upriver from ravine that runs down from pasture.
A few acres of cedar has just been logged out of this. This seems to be upon a secondary terrace between the main scarp and the flood plain.

above this, many cedars & pines have blown down. Large area of this. apparently more result of snow & ice than wind, many trees arched.
Grazing has been very heavy.
Deer tracks.
Several hundred cedar logs, 15-25 cm dbh, drying on ground in pasture.

Woods back of small house -
Mostly Pinus rigida with a few P. rigida? scattered suppressed cedars. A few small rabbit sheet gum. Thin Smilacina. Much Mitchella, Chimaphila maculata, some Lycopodium complanatum, Polystichum.
In thin snow, a path is melted off to south of each tree.

below bridge Betula nigra is very common, easily the commonest tree.

Corner of wood on rt. 2 thick Pinus virginiana
Toward middle of this part is a rather low area, with Betula nigra, Liquidambar, Acer rubrum, Quercus phellos, Q. palustris, very young Fagus.
Thin honeysuckle, or rather heavy & tangled.

Southward along hwy. 2 the forest becomes more scrubby. Old fields are grown up to Pinus virginiana about 3 m. tall, dense.
South from picnic table the bird becomes more abundant.

Where old rt. 17 cuts across main run beavers have made several dams and the valley bottoms where the 2 streams join are flooded. The old road bridge and embankment are still intact.
To utilize this as an entry for cattle to the stream would be practical but would necessitate some bulldozing to make a ramp.
Many trees here are flooded.

At New Post – intersection
bet. Rts. 2 + 17, a village
of a rather shacky type
has grown up across from
Belvedere Farm. One house
on the farm at this point.
A short distance down
Rt. 17 on left, is entrance
to Nottingham Estates,
apparently a new development
of a rather good type.
I did not notice this last
~~summer~~ fall.

Check paper on life history
of Cyperus circinalis in
Indian Jour. Bot. about 1960.