

Profile No. 1 February 28, 1958

2000-1000

Location - $\frac{1}{2}$ mile east of Village on island road.

Deep fine coral sand under coconut plantation. Slight depression - 100 yards from beach.

Ground cover of Fimbristylis and Lepturus. Area is surrounded with Scaevola on higher ridges.

Grass roots to 20".

Field pH

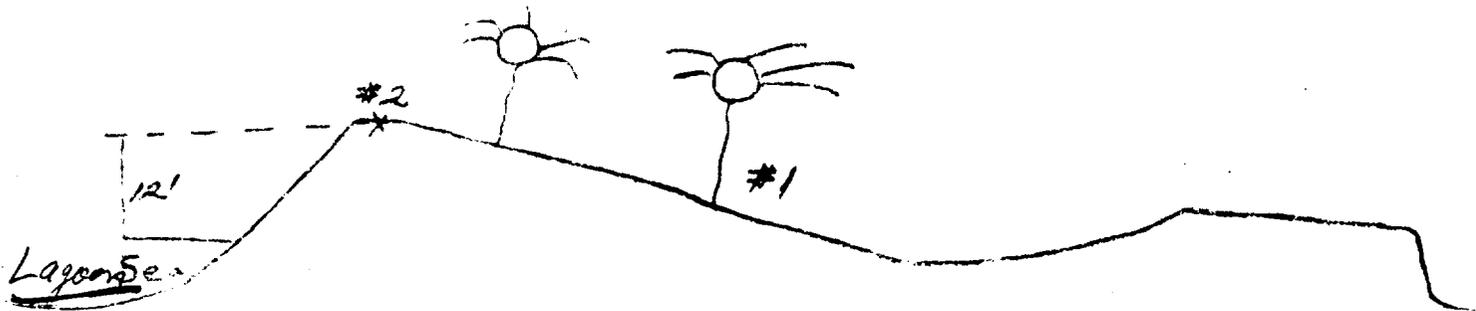
- A 8.35
- B 8.5
- C 8.8
- D 9.1
- E 9.1

SAMPLES

<u>Core</u>	<u>Radio</u>	<u>Chem</u>	<u>Profile</u>
A-0-2"	0-1 1-2 2-3 3-4 4-5 5-6 6-7 7-8 8-9	A-1-0-5"	
B-9-11"		B-2-7-12"	
C-18"		C-3-12-22"	
D-30"		D-4-22-36"	
E-48"		E-5-36+	

BEST COPY AVAILABLE

50 yards north of #1.



On beach ridge. Lee side of island, just back from beach rock. Coral sand, with buried profile. Evidently, area is building up and older soils are buried periodically.

SAMPLES

Core	PH	Radio	Chem	Profiles	
	8.4	0-1	1-2	litter	0"
A-2"	8.4	1-2	2-5	loose-recent deposit coral sand	2"
		2-3		A ₁ C. matter	5"
	8.6	3-4	5-9	White coral	8"
		4-5			
		5-6			
B-8"	8.3	6-7	9-10	A ₁ -C. matter high roots	11"
		7-8			
C-14"	8.5		12-18	A ₁ Transit	15"
	9.0		13-27	light gray coral	
					37"
D-38"	9.0		30-44	Buried C ₁ O.M. INC.	
					44"
E-43"	8.5		48	Compact coral light	

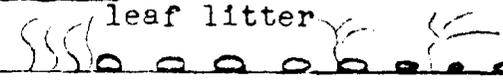
South of #1.



Scaevola forest area between Coconut plantation and windward sea. Dense forest. Guettarda tree over plot. Also scattered Pandanus - Coconuts.

This area has scattered coral beach rock throughout the fine coral -- probably thrown in by storms.

SAMPLES

<u>Core</u>	<u>PH</u>	<u>Radio</u>	<u>Chem</u>	<u>Profile</u>
	7.7 + 1/2	0-1	Ao 1/2"	leaf litter 
A-0-2	8.0	1-2	A	A1- Many roots. High O.M. 1"
B-4-6		2-3		4"
		3-4		A3- Roots. Some O.M.
	8.6	4-5	B	Loose coral. Frequent coral chunks. 16"
C-16-18		5-6		
		6-7		
	8.9	7-8	C	Loose - very. Coral. Few roots only. Frequent coral chunks. Loose coral. 31"
D-31-35				
	8.3		D	A1 Roots prevalent. Cemented O. Matter 35"
	8.8		E	A3 Cemented
	9.0		F	Looser. Some live roots. Coarse coral. 44"

Profile No. 4

March 4, 1958

Kabelle Island
100 yards S. of Cistern

Cover of Pisonia trees. Tern nesting in trees. Much droppings.
Ground cover of Boerhaavia.



Pisonia overhead. Boerhaavia ground cover. Many Guettarda,
Incroppings of Scaevola.

SAMPLES

Core	Radio	Chem	Profile
1250-0-1	1-2		
	2-3	PH	
A-0-2"	3-4	7.4	Ao 1/2"
	4-5	7.1	A1 Matted roots; Coral-fine 1"
	5-6	7.9	A12 Many roots 5"
	6-7	8.2	Loose coral
B-8-10			A3 Abundant roots 12"
		8.6	Loose - coarse some roots 20"
		8.8	Loose - coarse White coral few roots 26"
1" leach	7.2		Cemented coral
1" leach	7.2		loose coral
5" leach	7.2		Cemented loose 36"
pH - H2O	715		Brakish Water
			With well pt. 7'

Profile No. 5

March 4, 1958

Kaballe Island - 100' N. of # 4, under Guettarda tree.
Guettarda, Messerschmitia and Scaevola.

SAMPLES

<u>Core</u>	<u>Radio</u>	<u>PH</u>	<u>Chem</u>	<u>Profile</u>	
	0-1			leaf litter	
	1-2	7-1	A	G. Matter INC.	
0-2"A	2-3	.		Many roots	
	3-4			Loose coral	
	4-5				
	5-6				
	6-7				6"
				Roots	
		8-9	B	Loose coral	
11-13-B					16"
				Light color	
		8-9	C	Loose coral	
					24"
				Cemented	
				Coral	
				Soft coral	30"
				Water in pipe	45"

Large quantity of water flowing through pipe at 45" - at high tide.

Profile No. 6 March 4, 1958

Scaevola -- scattered plants on lee edge of Kabelle Island.
Coral is alga-coated.

Open Scaevola - Guettarda. Assoc. few Messerschmitia.
Stunted scattered growth of all plants. Few Lepturus.

SAMPLES

<u>Core</u>	<u>Radio</u>	<u>Chem</u>	<u>Profile</u>
n	0-1	PH	
o	1-2	8.9 AC- $\frac{1}{2}$	<u>Alga cement</u> / "
n	2-3		
e	3-4		
	4-5	9.1 B1-11	Loose coral - Somewhat layered.
	5-6		Fine and coarse strata. Very
	6-7		few roots.
		9.2 C11-38	

Cemented Coral 48°

Profile No. 7

March 5, 1958

Kaballe Island. Coconut grove -- near Cistern.
Coconut, few Pandanus - Pisonia - old.
Some birds nesting in vicinity.

PH - Sea Water from Rongelap beach
3-6-58 - 8.1

SAMPLES

<u>Core</u>	<u>Radio</u>	<u>PH</u>	<u>Chem</u>	<u>Profile</u>
Ao-2	0-1 1-2 2-3 3-4	8.3	A	Thin litter <u>A1 Dark</u> 3"
B4	4-5 5-6	8.3	P	<u>A2 Dark</u> 11"
C18	6-7	8.5	C	<u>A3 Gray</u> 21"
D25		8.3	D	Loose coral - white Large roots of coconut.
E36		8.5	E	Capillary water <u>roots</u> 51"
Water from water table pH <u>7.1</u>				Water table brachis - loose coral Some roots seem to go into water table. Well point did not hit cemented layer.

Ronselap - South of #2 - 17 yards.

Scaevola stands - closer to sea. Dense, tall Scaevola stand.
 Few Gastropoda - occasional Porifera. Near Ochrosia group.

Area apparently is inundated by sea water occasionally or has been given a succession of deposits.

SAMPLES

Core	Depth	SH	Temp	Analysis	
	0-1				
	1-2				
	2-3				
	3-4				
	4-5				leaf litter
	5-6				
	6-7	8.4	A	A1	Several deposits in this layer.
	7-8				
		8.6	B	A3	Light grey coral Roots
		8.3	C	A1	Thin A1 - buried
		8.8	D	A3	Coral chunks - considerable charcoal - some roots below
		9.1	E	C	Coral sand - chunks coral - light grey - roots scattered

Profile No. 9 March 8, 1958

Upper N. end of Eniaetok.

Coconut, Pisonia, Pandanus, grass cover.

Depression area 100 yards from Lee ridge, 300 yards from
Windward, near end of island in coarser material.
Vegetation is quite productive.

SAMPLES

<u>Core</u>	<u>Radio</u>	<u>PH</u>	<u>Chem</u>	<u>Profile</u>
0-2	0-1			
3-5	1-2			
	2-3			
	3-4	7.9	A	Very black
	4-5			9"
	5-6	7.8	B	Many roots - black
	6-7			18"
	7-8	8.1	C	Cemented Black
		8.1	D	Cemented Gray coral
				24"

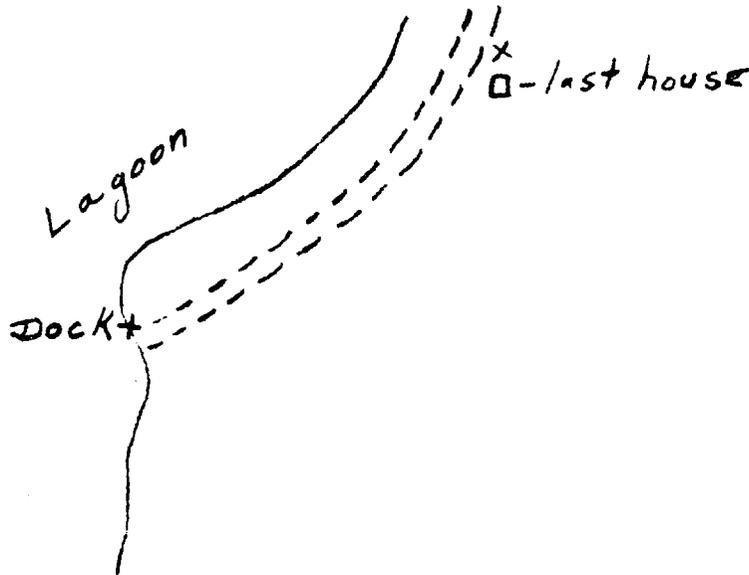
Rather coarse - not able to dig
deeper.

Soil is very black to hardpan. This is the most highly
organic soil seen on islands. Could have been a depression
area deep enough to hold water at one time.

Profile No. 10

March 3, 1958

Eniaetok - 100' N. of last house on road up Lee of island.
On Lee sand ridge. Coconut plantation.



SAMPLES

<u>Core</u>	<u>Radio</u>	<u>PH</u>	<u>Chem</u>	<u>Profile</u>	
0-1					
1-2					
2-3					
3-4					
4-5	8.1	A		A ₁ Finer	More recent
5-6	8.3	B		A ₃ Sand	deposit.
6-7					
	8.1	C		A ₁ Heavy root cong.	8"
	8.1	D		A ₃ Large roots.	12"
	8.8	E		Loose - white coral	15"
				Some roots.	
	8.8	F		Loose - coarse - coral	33"

Profile No. 11

March 8, 1958

On Eniaetok - 50' from Crossroads at village -- in
Coconut plantation. Level area - good growth.



This is quite a productive soil on basis of the Coconut trees
area that has been under cultivation, but soil has not been
disturbed very much.

Vegetation sample taken here.

SAMPLES

<u>Core</u>	<u>Radio</u>	<u>PH</u>	<u>Chem</u>	<u>Profile</u>	
0-1					
1-2					
2-3					
3-4		8.5	A	A ₁ roots	
4-5					3"
5-6		8.5	B	A ₃	
6-7					14"
		8.3	C	A ₁ Many roots	
		8.5	D	A ₁₁ roots	17"
		8.9	E	A ₃	26"
					40"
				Loose - white Fine coral	

Profile No. 12

March 10, 1958

Kabelle - Island.

Messerschmitia. Large trees, 35' tall. Dense stand, with good 1" organic matter.

E. of sample under Pisonia trees.

SAMPLES

<u>Core</u>	<u>Radio</u>	<u>PH</u>	<u>Chem</u>	<u>Profile</u>		
0-2	<i>A₁</i> { 0-1 <i>A₃</i> { 1-2 2-3 3-4 4-5 5-6 6-7 7-8	8.3	A ₀	Thin litter		
2-4				Many seeds		
		5-6	7.9	A ₁	A ₁	
		6-7	8.2	B	A ₃ Fine	1"
		7-8			sand	
			8.2	C	A ₃ -2 coral	4"
					A ₁	9"
			8.7	D	A ₃	10"
		8.4	E	A ₁	14"	
				A ₃	17"	
					22"	
		9.0	F	Coarse - coral		
				Some larger stone	36"	

Labeled so top is up left to right.

Maybe 14 at depth

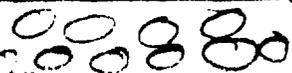
Kabelle Island.

Scaevola stand nearer ocean from # 12 - about 50 yards. 100 yards from sea. Coral is quite coarse - large chunks to fine. About 50% of material is large chunks.

Surface is fairly free of stones but is coarser sand. Rocks are abundant at 18" and below. A poor soil compared to those on interior of Island.

Evidence of 2 buried profiles.

SAMPLES

<u>Core</u>	<u>Radio</u>	<u>PH</u>	<u>Chem</u>	<u>Profile</u>	
	0-1				
	1-2				
	2-3			1" leaf litter	
	3-4	7.8	A	A ₁ Thin O.M. INC.	1"
	4-5				
	5-6			small roots	
	6-7	8.4	B	A ₃	9"
		8.4	C	A ₁ Roots abund.	11"
		8.7	D	A ₃ Some roots.	16"
		9.1	E		22"
		8.7	F	A Very indistinct	25"
					31"
				50% large coral 	
		9.0	G	Roots through 36" +	
				Coarse coral to below 36"	

Profile No. 14

Scaevola - some Messerschmitia

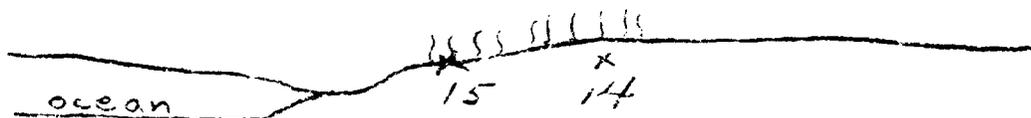
Pit is about 100 yards from Windward ocean, but above present beach. Area well stabilized by vegetation. Begins to slope seaward from here.

Almost pure Scaevola interspersed with open areas of extremely rocky surface soil. Pit is under Scaevola.

SAMPLES

<u>Core</u>	<u>Radio</u>	<u>PH</u>	<u>Chem</u>	<u>Profile</u>
0-2"	0-1			Litter - 1-2" size coral on surf.
(3 taken)	1-2			A ₁ Roots
	2-3	7.8	A	_____ 2"
	3-4			_____ <i>Coarse</i>
	4-5	8.5	B	A ₃ Roots
	5-6			_____ <i>CORAL</i>
	6-7	8.3	C	Variable size rock.
	7-8			_____ 18"
				Less rock - more sand
				_____ 24"
		8.7	D	A ₁ Roots
				_____ 26"
		8.7	E	A ₃
				_____ 32"
		8.4	Bag	A ₁ Roots
				_____ 34"
		8.9		{ _____ 45"
		8.5	Bag	A ₁ large coral
				many roots
				_____ 49"
				large coral pieces
				80% rock
				_____ 68"
		8.7	F	A ₁ Weak - sandy
				_____ 74"

Pure Scaevola - on beach slope - 50' from sea - edge of vegetation - area is washed by high tides as fish (glass) balls were found at pit site - also bottles in brush.



Scaevola is stunted by wind exposure.
 Stratified deposits of beach sand. No distinct buried horizons as probably not time to develop.

SAMPLES

<u>Core</u>	<u>Radio</u>	<u>PH</u>	<u>Chem</u>	<u>Profile</u>
0-1				
1-2				
2-3				o o o o o 1" litter layer
3-4		8.5	A	Very little devel.
4-5				Young soil. 5"
5-6				Stratified
6-7		9.0	B	throughout depth layers about 22"
				1" depth apart
				all loose
		9.2	C	coral - some variation in texture. 40"
				No definite horizons
				Roots throughout
		9.0	D	Concentrations in some areas but not heavy
		9.0		Roots to depth 60"
				o o o o o Rock layer 55"
No water signs				Not flat beach rock

Edge of Wash between N. and S. Kabelle - under first Scaevola
edge on N. Kabelle - Very young sterile soil.

Messerschmitia in Wash area - 3' tree has root spreading
out 3-6" deep - 30' from tree in loose coral.

Two additional samples taken in Wash area --

- #1 - Tidal area
- #2 - Slightly higher near Mes. referred to above.

SAMPLES

<u>Core</u>	<u>Radio</u>	<u>PH</u>	<u>Chem</u>	<u>Profile</u>
	0-1			
	1-2	8.9	AE	
	2-3			Roots to
	3-4	8.5	F	consolidated layer
	4-5			Consolidated cemented coral
				not beach rock
		8.9	C	Loose coral
				H ₂ O level
				Soil is stratified throughout

PH

WASH #1-0" - 8.3
 " 2-0" - 8.7
 " 2-0-6" 8.3
 # 1-Surface 8.7
 # 2-1" 8.7

Profile No. 17

March 12, 1958

Rongelap - upper Island transect - 50 yards beachward
from # 8. 90' from beach edge of Scaevola.

Stabilized area of heavy Scaevola - few Guettarda. Many
dead portions of Scaevola. Complete leaf litter on surface.

SAMPLES

<u>Core</u>	<u>Radio</u>	<u>PH</u>	<u>Chem</u>	<u>Profile</u>
	0-1			1" litter
	1-2			A ₁
	2-3	7.7	A	1"
	3-4	8.2	B	A ₃ Some O.M. - fine coral - sand
	4-5			5"
	5-6	8.7	C	14"
	6-7			A ₁
		8.6	D	15"
		9.0	E	Loose coral
				36"
		8.9	F	Roots to depth
				50"
				loose coral

Profile No. 18

March 12, 1958

Road-trail to upper part of Island crosses Swale beyond ship beer garden - about $\frac{1}{4}$ mile from boat - narrow Swale about 50' wide.

Vegetation is predominantly Suriana - low growth. Some Scaevola and Messerschmitia. Suriana seems to be more characteristic of this and similar areas.

Soil is very shallow to beach (?) rock through this area - seems to be an old Wash.

SAMPLES

<u>Core</u>	<u>Radio</u>	<u>PH</u>	<u>Chem</u>	<u>Profile</u>
0-1				
1-2				
2-3				
3-4				
4-5		8.1	A	A ₁ Poor A ₁ devel. 1"
5-6				
6-7		8.5	B	5"
7-8		8.6	C	
				18" Quite solid rock layer. Some roots in Crevices.

Profile No. 19

March 13, 1958

This is a very dry profile on this date. Roots throughout. Hard to decide where plants get adequate water supply.

Off road from Village Lab Bldg to ocean. About $\frac{1}{4}$ mile from Village. Center of Island in this area seems to be about same soil material.

Palm, Pandanus, Guettarda, some Pisonia mixture, also ground cover of grass etc. More luxuriant cover than other Palm areas. Also good litter layer.

SAMPLES

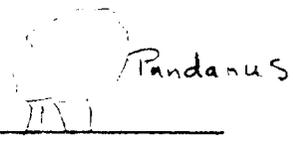
<u>Core</u>	<u>Radio</u>	<u>PH</u>	<u>Chem</u>	<u>Profile</u>	
	0-1				
	1-2				
	2-3				
	3-4				
	4-5			Very black - thick	
	5-6	8.0	A	A ₁ O.M. horizon	
	6-7			high roots - dry	
	7-8				11"
		8.5	B	A ₃ Fine coral	16"
				Coarse - loose	
		8.9	C		
		8.9	D	Cemented layer	29"
				Soil development	30"
				loose coral	
		9.1	E		
		8.9	F	Loose - fine coral - white	40"
					50"

Profile No. 20

March 13, 1958

100 yards toward Village from #19. Cocconut, Pandanus area.
21' to under Pandanus tree.

SAMPLES

<u>Core</u>	<u>Radio</u>	<u>PH</u>	<u>Chem</u>	<u>Profile</u>
0-1				
1-2				
2-3				
3-4				
4-5		8.0	A	Very dark horizon X  Pandanus
5-6				8"
6-7				A ₁ Many roots
7-8				
		8.1	B	18"
		8.8	C	Loose coral
				40"
				Slight cementation at 40" - not distinct
		9.0	D	48"
				Roots still

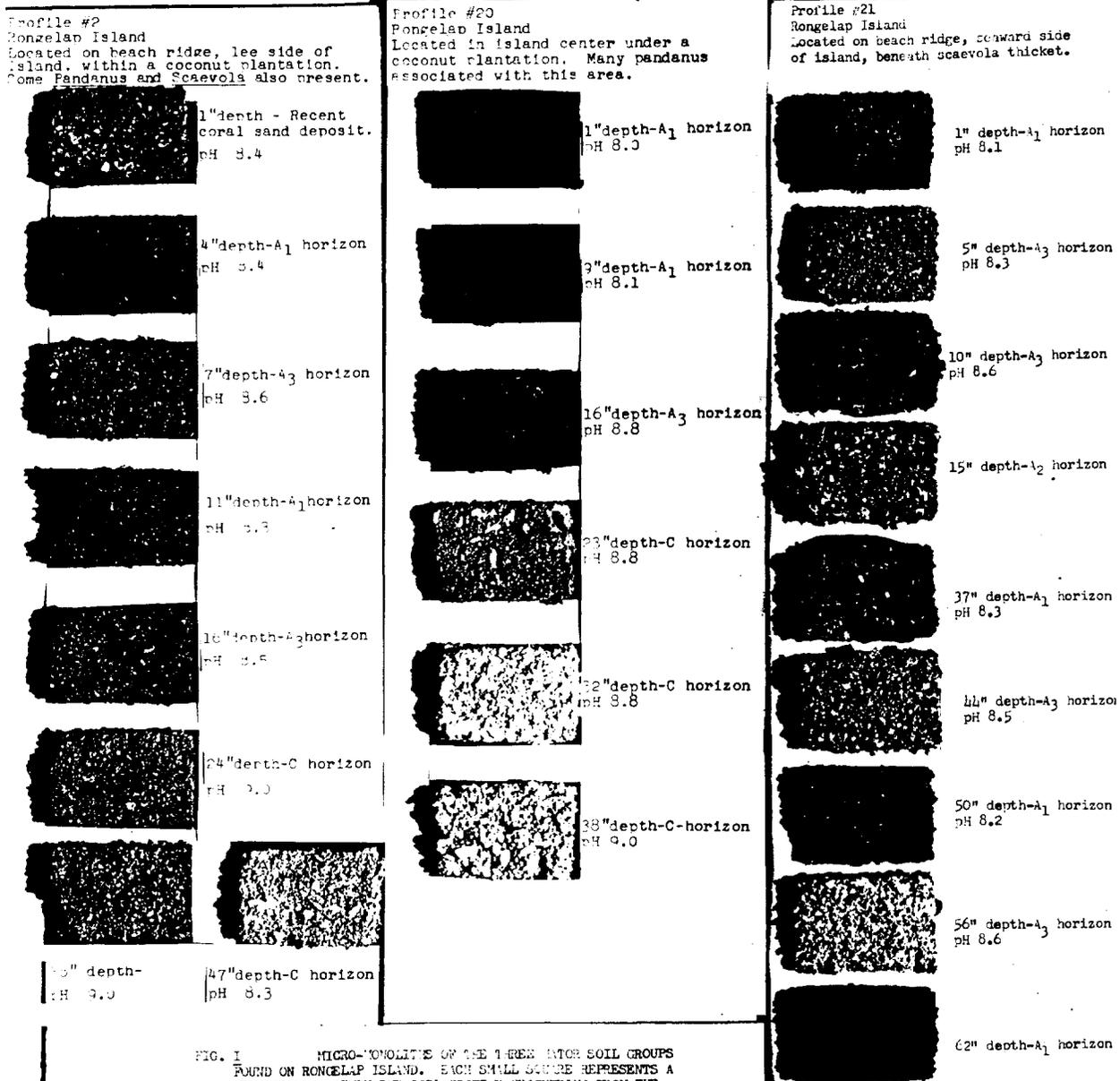


FIG. 1. MICRO-MONOLITHS OF THE THREE MAJOR SOIL GROUPS FOUND ON RONGELAP ISLAND. EACH SMALL SQUARE REPRESENTS A NEW HORIZON WITHIN THE SOIL PROFILE PROCEEDING FROM THE SURFACE TO THE BOTTOM OF THE SOIL PIT. THE DARK SQUARES ARE A₁ HORIZONS, HIGH IN ORGANIC MATTER. NOTE THE DIFFERENCE IN DISTRIBUTION OF A₁ HORIZONS IN THE THREE GROUPS.



FIG. II PHOTOGRAPHS OF THE ROOT DISTRIBUTION OF A FOUR FOOT MESSERSCHMIDIA. GROWING IN STERILE SOIL ON KABELLE ISLAND. THE POLE LYING IN THE FOREGROUND IS 13 FEET LONG. ROOTS EXTENDED 60 FEET FROM THE ROOT CROWN AND REMAINED WITHIN 4 TO 5 INCHES OF THE SURFACE.

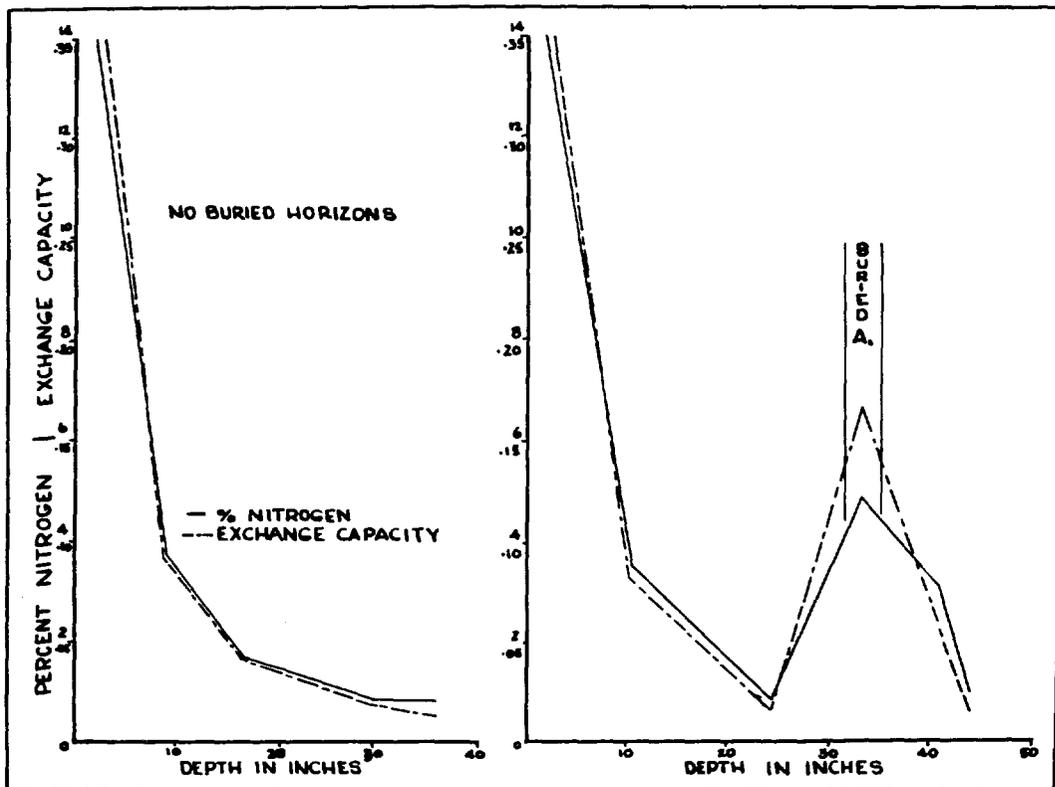


FIG. IV. PERCENT NITROGEN AND EXCHANGE CAPACITY IN M.S. PER 100 GMS. FOR THE SAME SOIL PITS AS SHOWN IN FIG. III, PLOTTED OVER SOIL DEPTH.

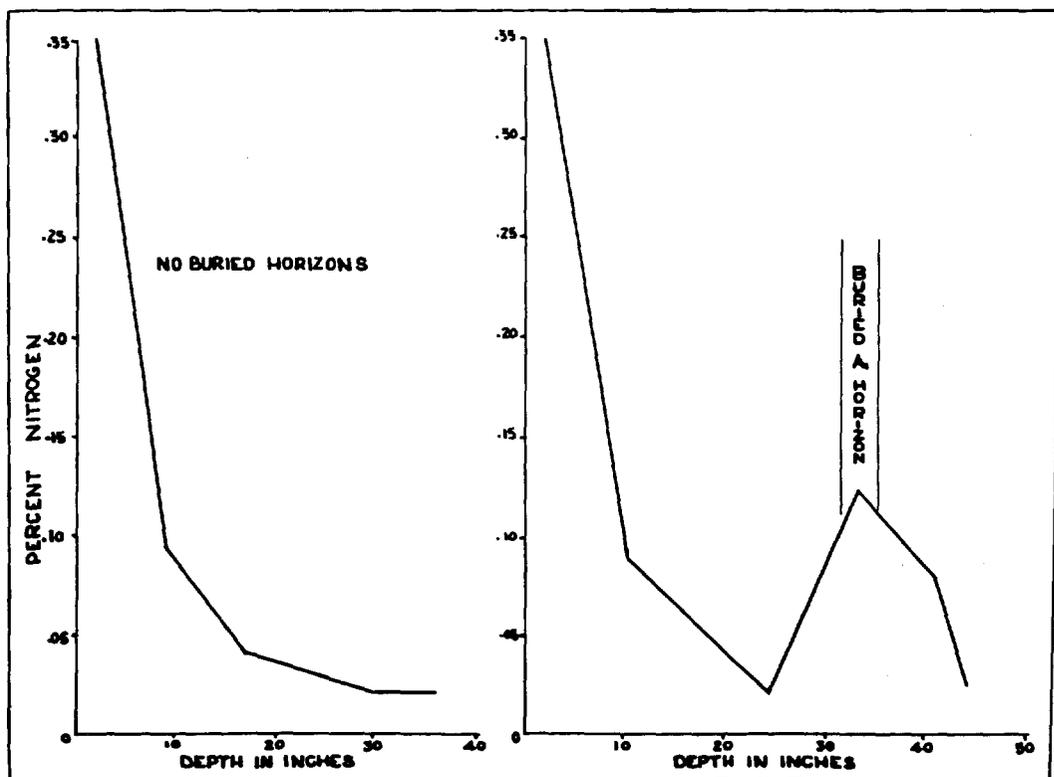


FIG. III. PERCENT NITROGEN PLOTTED OVER SOIL DEPTH FOR TWO PROFILES. THE LEFT HAND FIGURE SHOWS THE DISTRIBUTION OF NITROGEN IN A PROFILE WITH NO BURIED A₁ HORIZONS. THE RIGHT HAND FIGURE SHOWS THE DISTRIBUTION IN A PROFILE WITH ONE BURIED A₁ HORIZON.

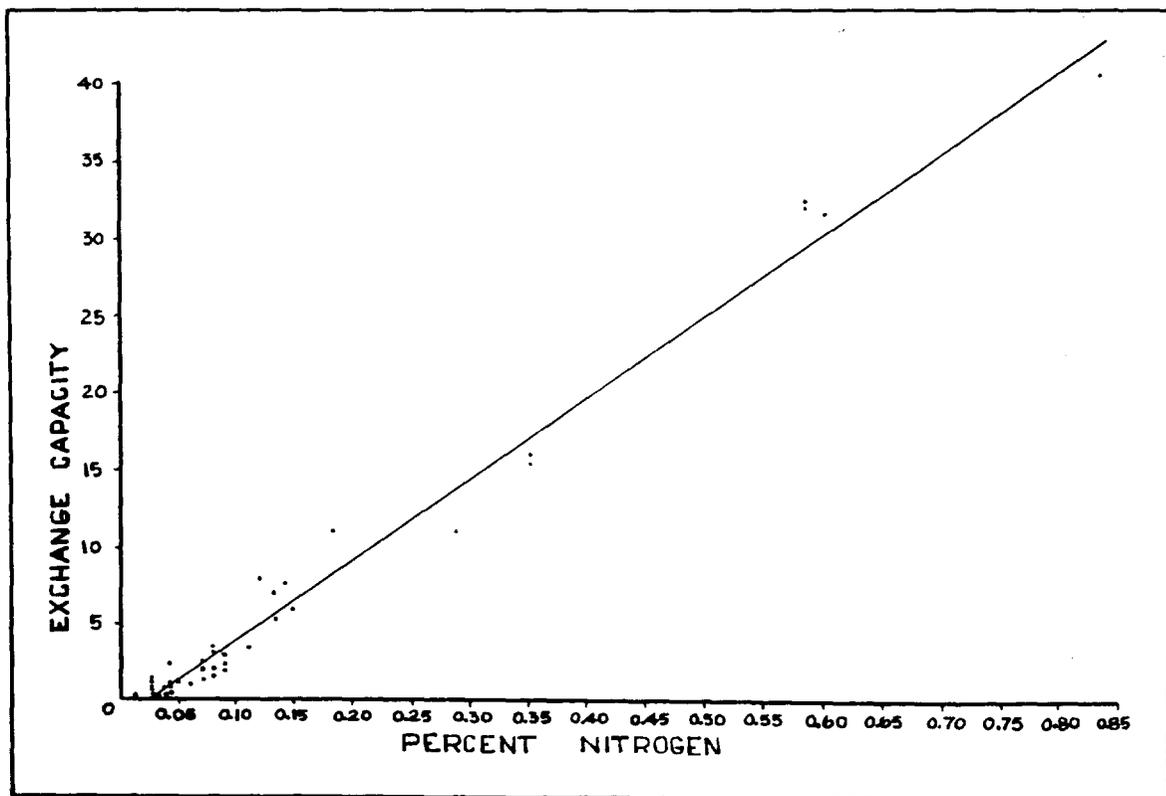
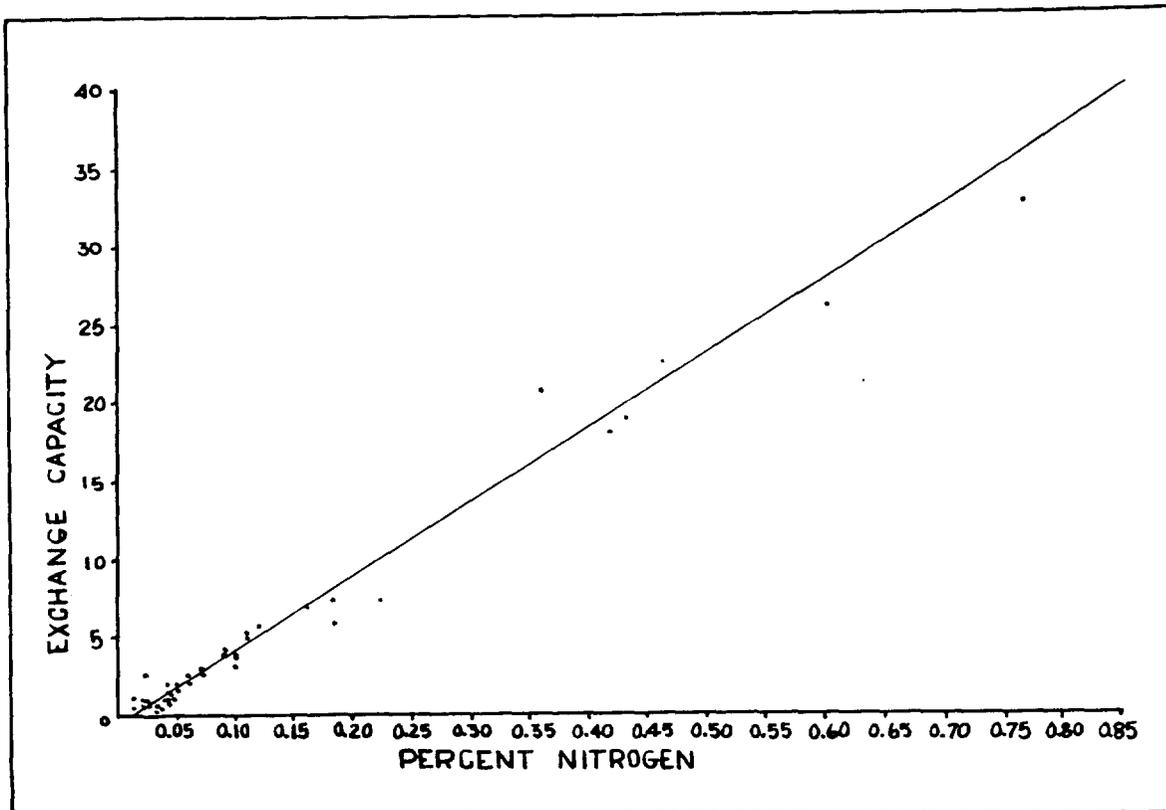


FIG. V EXCHANGE CAPACITY (%/100 G.S.) AND PERCENT NITROGEN VALUES WITH CURVE WHICH BEST FITS THESE VALUES. THE UPPER CURVE IS FOR KAVELLE ISLAND. THE LOWER CURVE FOR RONGELAP.