Profile No. 1 February 28, 1958

Location - ½ mile east of Village on island road.

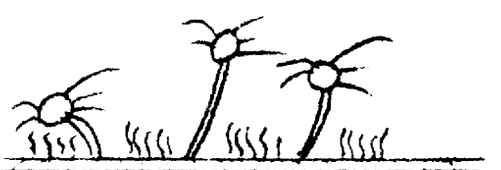
Deep fine coral sand under coconut plantation. Slight depression - 100 yards from beach.

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

Grass roots to 20".

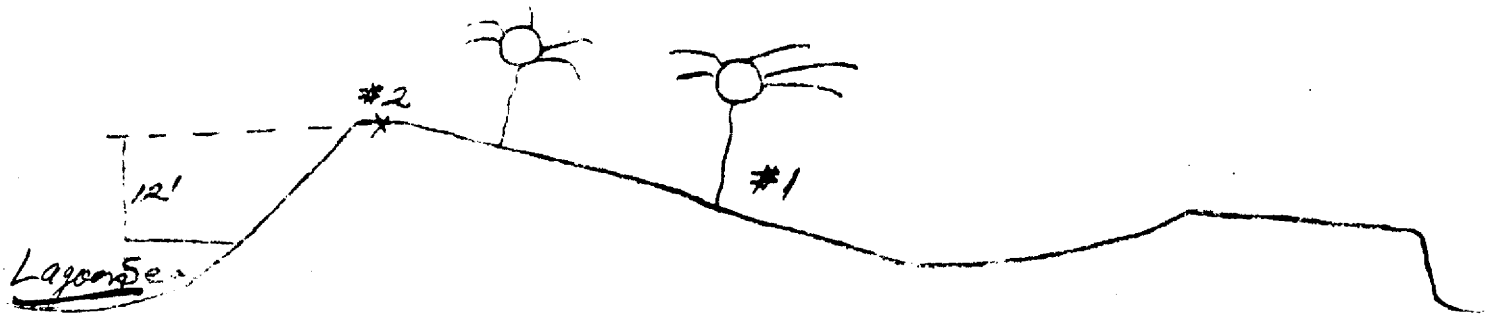
Field pH
A 8.35
B 8.5
C 8.8
D 9.1
E 9.1

SAMPLES

Core	Radio	Chem	Profile
A-0-2"	0-1 1-2 2-3 3-4 Organic 4-5 layer 5-6 6-7 7-8 8-9	A-1-0-5"	 1" A1 - O. M. - grass black color 5"
B-9-11"		B-2-7-12"	Transition A3 zone - to white coral 12"
C-18"		C-3-12-22"	Heavy - coconut root zone 22"
D-30"		D-4-22-36"	few roots here Coconut roots to 3' 36"
E-48"		E-5-36+	Compact coral sand. Coconut roots to complete depth - scattered only - 48" most may be dead.

Profile No. 2 March 1, 1958 RONGELAP

50 yards north of #1.



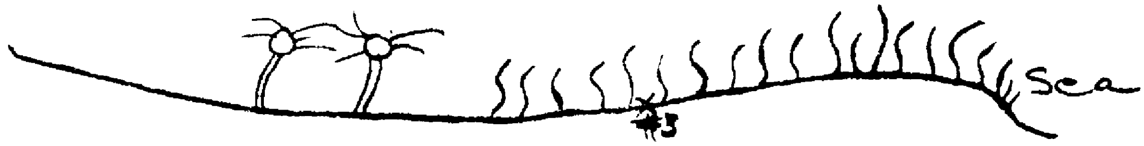
On beach ridge. Lee side of island, just back from beach rock. Coral sand, with buried profile. Evidently, area is building up and older soils are buried periodically.

SAMPLES

Core	PH	Radio	Chem	Profiles	
	8.4	0-1	1-2	litter	0
A-2"	8.4	1-2	2-3	Loose-recent deposit coral sand	2"
		2-3		A_1 O. matter	5"
	8.6	3-4	5-6	White coral	8"
		4-5			
		5-6			
B-8"	8.3	6-7	9-10	A_1-O. matter high roots	11"
		7-8			
C-14"	8.5		13-14	A[illegible] Transit	15"
	8.0		18-19	Light gray coral	37"
D-38"	8.0		[illegible]	Buried A_1 O.M. INC.	44"
E-43"	8.5		48	Compact coral light	

Profile No. 3 March 1, 1958

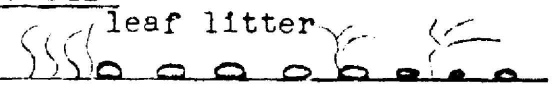
South of #1.



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.

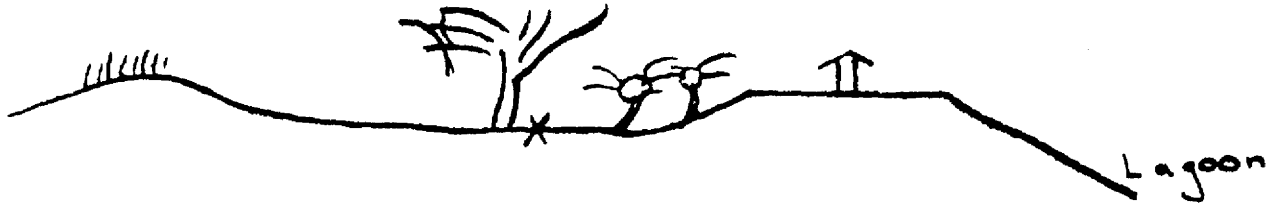
SAMPLES

Core	PH	Radio	Chem	Profile
	7.7 + ½		Ao½"	 1"
		0-1		
A-0-2	8.0	1-2	A	A1- Many roots. High O.M. 4"
		2-3		
B-4-6		3-4		A2- Roots. Some O.M. Loose coral. Frequent coral chunks.
		4-5		
	8.6	5-6	B	16"
C-16-18		6-7		
		7-8		
	8.9		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 44"
	9.0		F	Looser. Some live roots. Coarse coral.

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
	1-2		
	2-3	PH	
A-0-2"	3-4	7.4	Ao
	4-5	7.1	A
	5-6	7.9	B
	6-7	8.2	C
B-8-10			
		8.6	D
		8.8	E

1" leach7.2
1" leach7.2

5" leach7.2

pH - H2O
715

Profile

Ao ½"
A1 Matted roots; Coral-fine 1"
A12 Many roots 5"
Loose coral
A3 Abundant roots 12"
Loose - coarse
some roots 20"
Loose - coarse
White coral
few roots 26"
Cemented coral
loose
coral 36"
well point Cemented
loose
Brakish Water
With well pt. 7'

Profile No. 5 March 4, 1958

Kwajalein Island - 100 ' N. of # 4, under Guettarda tree.
Guettarda, Messerschmitia and Scievola.

SAMPLES

Core	Radio	PH	Chem	Profile
	0-1			leaf litter
	1-2	7-1	A	O. Matter INC.
0-2"A	2-3			A1 Many roots
	3-4			Loose coral
	4-5			
	5-6			
	6-7			
				6"
				Roots
	8-9		B	A2 Loose coral
11-13-B				
				16"
				Light color
	8-9		C	C1 Loose coral
				24"
				Cemented Coral
				30"
				Soft coral
				Water in pipe 45"

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

Profile No. 6 March 4, 1958

Scaevola -- scattered plants on le: edge of Kabelle Island. Coral is algea-coated.

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

SAMPLES

Core	Radio		Chem	Profile
n	0-1	PH		
	1-2	8.9	A0-½	Algea cement 1"
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	

48"

Cemented Coral

Profile No. 7 March 5, 1958

Kabelle 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

Core	Radio	PH	Chem
Ao-?	0-1	8.3	A
	1-2		
	2-3		
	3-4		
B4	4-5	8.3	P
	5-6		
C_{13}	6-7	8.5	?
D_{25}		8.3	D
E_{36}		8.5	E

Water from
water table
pH 7.1

Profile

Thin litter

A1 Dark ——— 3"

A2 Dark ——— 11"

A3 Grey ——— 21"

Loose coral - white
Large roots of coconut.

Capillary water
roots ——— 57"

Water table
Breccia - loose coral
Some roots seem to go into water table.
Well point did not hit cemented layer.

Profile No. 8 March 6, 1958

Ronrelap - South of [illegible] yards.

Scaevola stand - closer to sea. Dense, tall Scaevola stand. Few Guettarda - occasional Pandanus. Near Ochrosia grove.

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

SAMPLES

Core	Depth	pH	Layer	Notes
	0-1			
	1-2			
	2-3			
	3-4			
	4-5			
	5-6			
	6-7	8.4	A	A1 [illegible] 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 - [illegible]
		9.1	E	C Coral sand - chunks of coral - light grey - [illegible]

12

21

4

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.

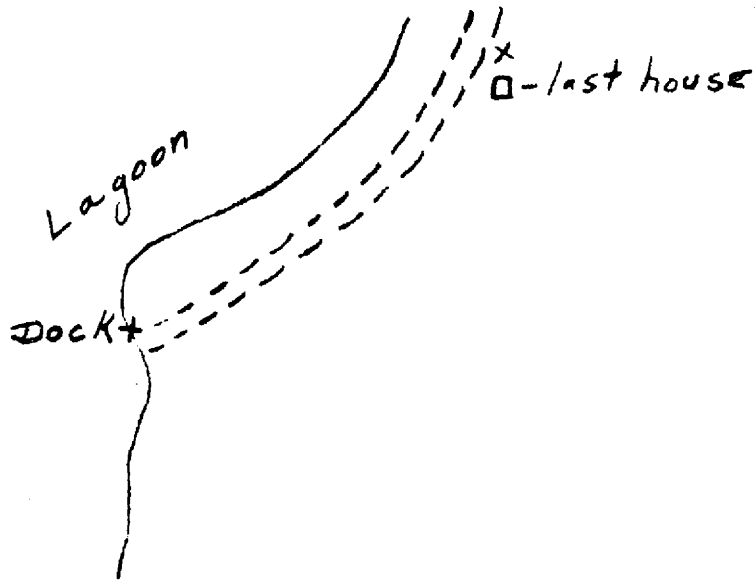
SAMPLES

Core	Radio	PH	Chem	Profile
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
				24"
		8.1	D	Cemented Gray coral
				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.

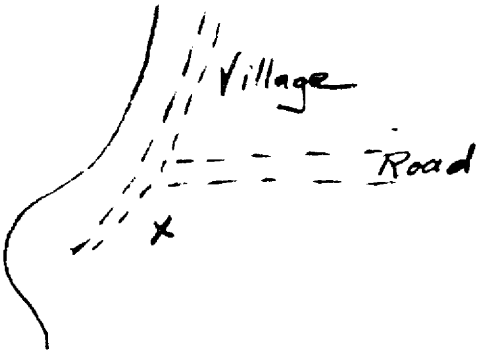


SAMPLES

Core	Radio	PH	Chem	Profile
	0-1			
	1-2			
	2-3			
	3-4			
	4-5	8.1	A	A_1 Finer More recent — 4"
	5-6	8.3	B	A_3 Sand deposit — 8"
	6-7			
		8.1	C	A_1 Heavy root cong. — 12"
		8.1	D	A_3 Large roots. — 15"
		8.8	E	Loose - white coral Some roots. — 33"
		8.8	F	Loose - coarse - coral

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

Core	Radio	PH	Chem	Profile
	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
				17"
		8.5	D	A_{11} roots
				26"
		8.9	E	A_3
				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

Core		Radio	PH	Chem	Profile	
0-2		0-1				
2-4		1-2				
	A_1	2-3			Thin litter	
		3-4	8.3	A_0	Many seeds	
		4-5				
	A_3	5-6	7.9	A_1	A_1	1"
		6-7				
		7-8	8.2	B	A_3 Fine sand	4"
			8.2	C	A_{3-2} coral	9"
Labeled so top is up Left to right.					A_1	10"
			8.7	D	A_3	14"
			8.4	E	A_1	17"
					A_3	22"
			9.0	F	Coarse - coral Some larger stone	36"

Maybe 14 at depth

Profile No. 13 March 10, 1958

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

Core	Radio	PH	Chem	Profile
	0-1			
	1-2			
	2-3			1" leaf litter
	3-4	7.8	A	A_1 Thin O.M. INC. 1"
	4-5			small roots
	5-6			
	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"

Kabelle

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.

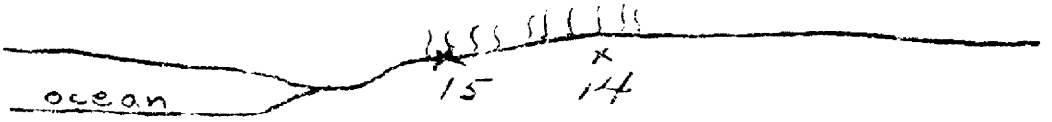
Almost pure Scaevola interpersed with open areas of extremely rocky surface soil. Pit is under Scaevola.

SAMPLES

Core	Radio	PH	Chem	Profile
0-2" (3 taken)	0-1			
	1-2			Litter - 1-2" size coral on surf.
	2-3	7.8	A	A_1 Roots
	3-4			Coarse 2"
	4-5	8.5	B	A_3 Roots
	5-6			Coral 6"
	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"

Profile No. 15 March 11, 1958

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

Core	Radio	PH	Chem	Profile
	0-1			
	1-2			
	2-3			½" 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
				Concentrations in some areas
		9.0	D	but not heavy
		9.0		60"
				Roots to depth
				65"
No water signs				Rock layer
				Not flat beach rock

Profile No. 16 March 11, 1958

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 7-6" 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

Core	Radio	PH	Chem	Profile
	0-1			S
	1-2	8.9	A	X 11
	2-3			Roots to consolidated layer
	3-4	8.5	B	24
	4-5			Consolidated cemented coral not beach rock 31
		8.9	C	Loose coral
				42
				H2O level
				Soil is stratified throughout

PH

WASH #1-0" - 8.9
" 2-0-6" - 8.7
" 2-6-6" 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

Core	Radio	PH	Chem	Profile
	0-1			1" litter
	1-2	7.7	A	A_1 1"
	2-3			
	3-4	8.2	B	A_3 Some O.M. - fine coral - sand 5"
	4-5			
	5-6	8.7	C	14"
	6-7			
		8.6	D	A_1 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 ¼ 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

Core	Radio	PH	Chem	Profile
	0-1			
	1-2			
	2-3			Suriana
	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 ¼ 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

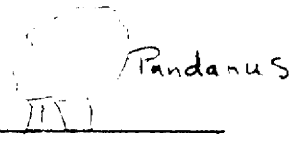
Core	Radio	PH	Chem	Profile
	0-1			
	1-2			
	2-3			
	3-4			
	4-5			Very black - thick
	5-6	8.0	A	A_1 O.M. horizon
	6-7			high roots - dry
	7-8			11"
		8.5	B	A_3 Fine coral 16"
				Coarse - loose
		8.9	C	
		8.9	D	Cemented layer 29"
				Soil development 30"
				loose coral
		9.1	E	
				40"
		8.9	F	Loose - fine coral - white
				50"

Profile No. 20 March 13, 1958

[illegible] yards toward Village from #19. Coccnut, Pandanus area.
[illegible] Pandanus tree.

SAMPLES

Core	Radio	PH	Chem	Profile
	0-1			
	1-2			
	2-3			
	3-4			
	4-5	8.0	A	Very dark horizon — 8"
	5-6			
	6-7			A_1 Many roots
	7-8			
		8.1	B	— 18"
		8.8	C	Loose coral — 40"
		9.0	D	Slight cementation at 40" - not distinct — 48"
				Roots still



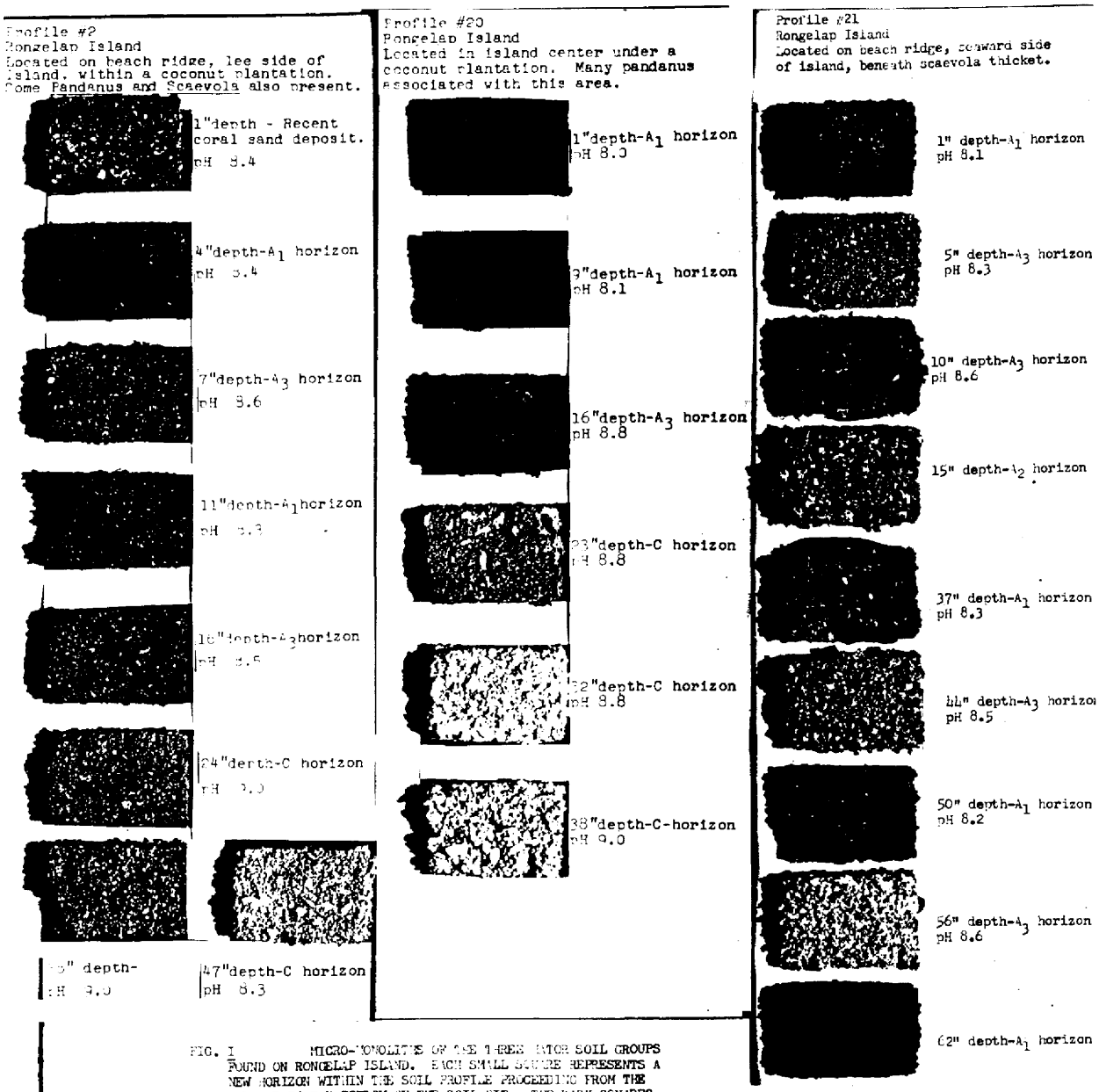


FIG. I MICRO-MONOLITHS OF THE THREE MAJOR SOIL GROUPS FOUND ON RONGELAP ISLAND. EACH SMALL SQUARE REPRESENTS A NEW HORIZON WITHIN THE SOIL PROFILE PROCEEDING FROM THE SURFACE TO THE BOTTOM OF THE SOIL PIT. THE DARK SQUARES ARE A_1 HORIZONS, HIGH IN ORGANIC MATTER. NOTE THE DIFFERENCE IN DISTRIBUTION OF A_1 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.

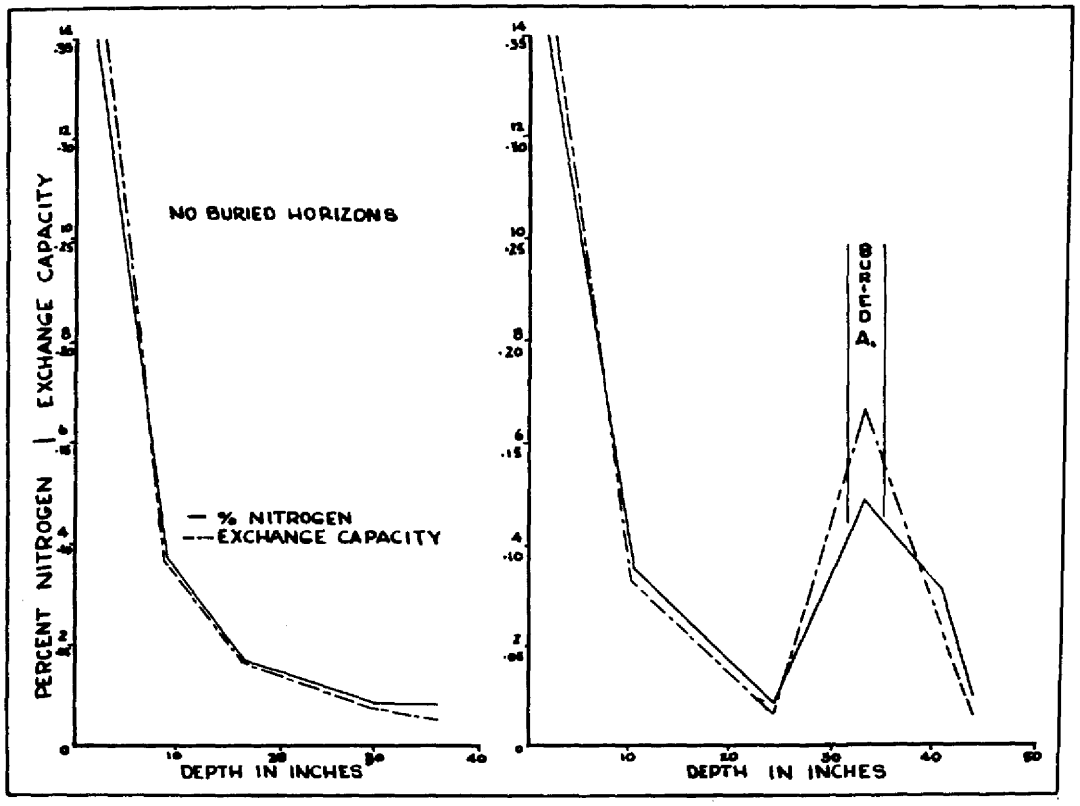


FIG. IV PERCENT NITROGEN AND EXCHANGE CAPACITY IN M.E. PER 100 GMS. FOR THE SAME SOIL PITS AS SHOWN IN FIG. III, PLOTTED OVER SOIL DEPTH.

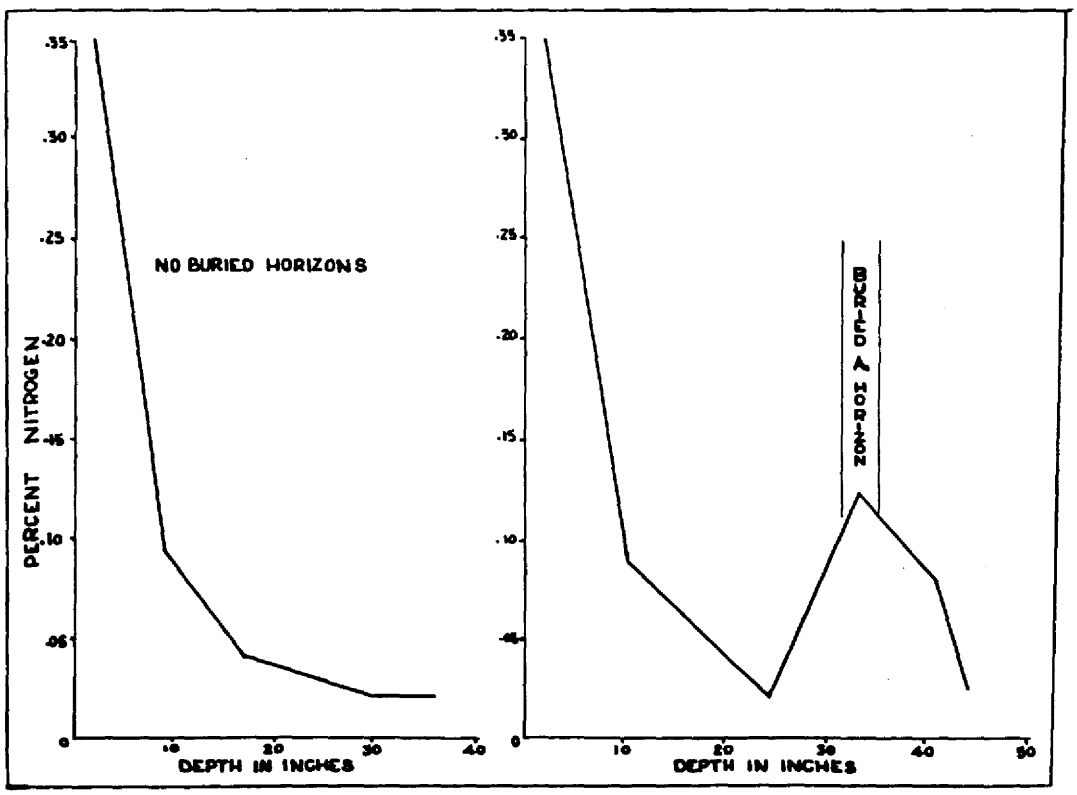
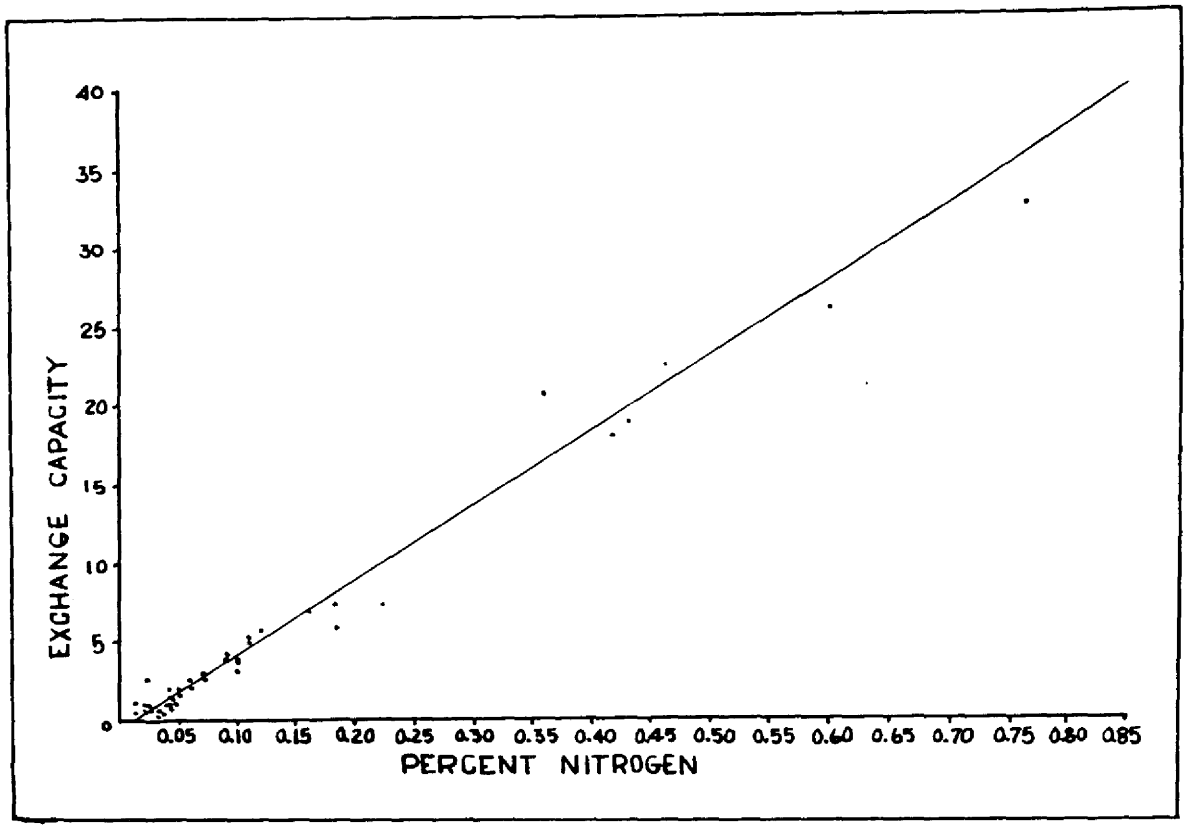


FIG. III PERCENT NITROGEN PLOTTED OVER SOIL DEPTH FOR TWO PROFILES. THE LEFT HAND FIGURE SHOWS THE DISTRIBUTION OF NITROGEN IN A PROFILE WITH NO BURIED A_1 HORIZONS. THE RIGHT HAND FIGURE SHOWS THE DISTRIBUTION IN A PROFILE WITH ONE BURIED A_1 HORIZON.



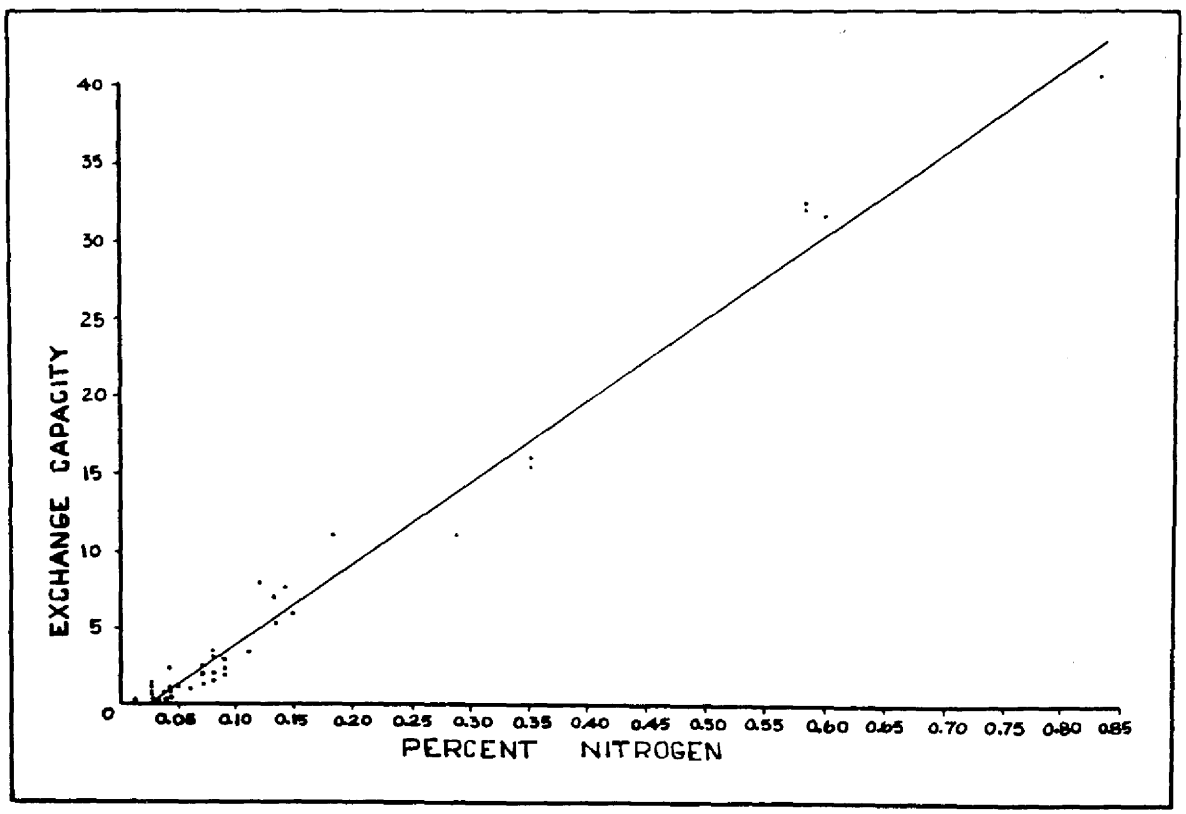


FIG. V EXCHANGE CAPACITY (.E./100 G S.) AND PERCENT NITROGEN VALUES WITH CURVE WHICH BEST FITS THESE VALUES. THE UPPER CURVE IS FOR KAPELLE ISLAND. THE LOWER CURVE FOR RONGELAP.