DRDGE 56
Mariana Is.
N.W. Fukuoka
Smt.

SAMPLE ID	*Mn CHEM	Pt & Au*	REE *	Si Chem*	P.Sect.	35mm Pho	Archive	Paleo	XRD				
D56-1	✓			✓									
D56-2	[illegible]							✓					
D56-3													
D56-4	✓												
D56-5													
D56-6													
D56-7													
D56-8													
D56-9													

* All chemistry samples have XRD mineralogy done also.

Mariana Is.

Cruise I.D: ~~L5-83-NW~~

Sample I.D: Sta: D56-1

Location: NW Pukatoku Smt

Depth: 1250-1500 m

1 big slab and pieces

Size: _____ Weight: 1.62 kg (total) (wet)

17x?x5.5 cm (big piece)

Mn crust thickness:

Total: min: 20mm max: 35mm ave: 30mm

Inner crust: min: ____ max: ____ ave: ____

Outer crust: min: ____ max: ____ ave: ____

Surface texture: _____

Internal structure: _____

layered: _____
laminated: _____
massive: _____
porous: _____
dendritic: _____
other: _____

Mariana Island

D56-1

Mineralogy (XRD): _____

Associated alteration, phosphorite, or hydrothermal deposits: _____

Substratum:

Rock type: Mudstone, burrowed

Description: burrows are filled & Mn stained

Crust looks like it may be hydrogenous and hydrothermal

Mineralogy (XRD): _____

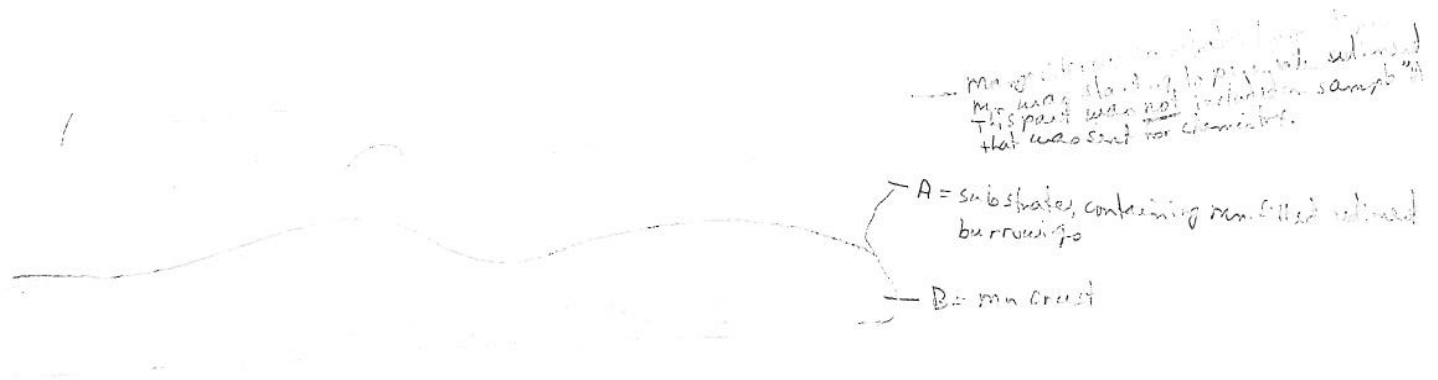
Analyses and subsamples:

analysis:	analyst:
Chemistry:	L. Morgenson
D56-1-A: substrate (bulk)	
D56-1-B: crust (bulk)	
XRD: from same sites	
D56-1-I: bulk Mn	
D56-1-II: substrate	
35 mm	
Paleo on Mudstone	

major & minors

bulk

Manheim


A = substrates, containing
B = mm crust

Sample Description

Cruise I.D: ~~L5-83-HW~~ Mariana Is.

Sample I.D: Sta: D56-2

Location: New Fukatoku Smt

Depth: 1250-1500m

Size: 25x14.5x6cm Weight: 2.1 kg (wet)

Mn crust thickness:

Total: min: max: ave:

D56-2

TT192

Mariana Is TT192

D56-2

Su

Ir

Mi

As

h

Substratum:

Rock type: Mn sandstone with layer(s) of dense Mn. Dense layer is

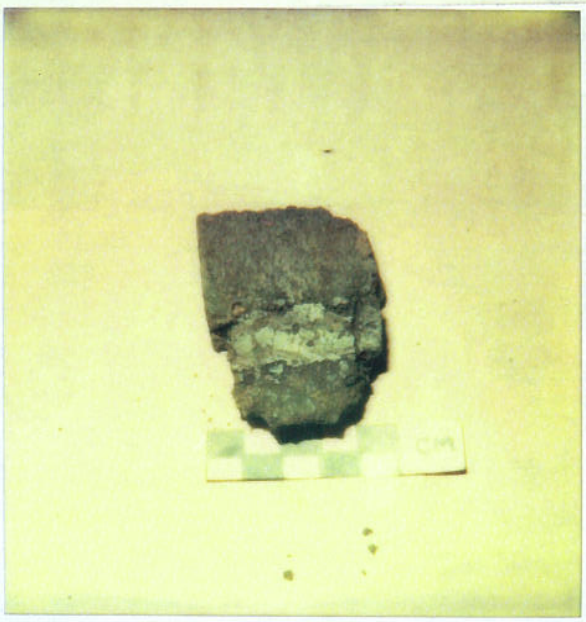
Description: 3 to 4.5 cm. 3 main layers lower layer is porous to dendritic this layer grades into the dense Mn layer. Contact of Dense layer and upper Mn Ss is sharp in one part and in the other the dendritic Mn continues into this layer. (Chem samples already taken at the time of this description) Pumice layer on bottom

Mineralogy (XRD):

Analyses and subsamples:

analysis:	analyst:
Chemistry: Bulk crust sample for "mantain"	J. Hiorgenson
XRD: (see photo on back)	
D56-2 I: upper layer	
D56-2 II: middle dense layer	
D56-2 III: bottom layer	
Brach[illegible] not identifiable per Ellen Moore	
Paleo[illegible] C[illegible] [illegible]	

Mariana Is.
D56-2



DPTS D56-2
TT192

SAMPLE DESCRIPTION

Cruise Id: TT192 Size: 19x10.5x5 cm Location: NW Fukutoku Seds

Sample Id: D56-3 Weight: 1kg Depth: 1650 - 1570

Mn Crust Description

Surface Texture: botryoidal

Mn Crust Thickness:

Min:_____ Max:_____ Ave:_____

Layers (Outer to Inner):

	Min	Max	Ave	Texture
1.				
2.				
3.				
4.				
5.				

Comments and XRD Mineralogy:

ANALYSES

Substrate Description

Rock Type: Breccia w/ Mn Cement

Description:

Volcanic clasts (up to 2cm) cemented by Mn. Most of the Mn appears hydrothermal. Mud & Sand incorporated into the matrix also.

Mariana Islands

Cruise I.D: TT-192

17x11x7cm

Size: 11x7x7cm **Weight:** 1998.0 gm (already slabbed)

Sample Description

Sample I.D: Sta: D56-4

Location: NW Fukatoku S.
Depth 1250-1500m

Mn crust thickness:

Total: min: ____ max: ____ ave: ____

Inner crust: min: ____ max: ____ ave: ____

Outer crust: min: ____ max: ____ ave: ____

Surface texture: ____

Internal structure: ____

layered: ✓
laminated: ✓
massive: ✓
porous: ✓
dendritic: ____
other: ____

Mariana Is TT192

D56-4

Mineralogy (XRD): ____

Associated alteration, phosphorite, or hydrothermal deposits: ____

Substratum:

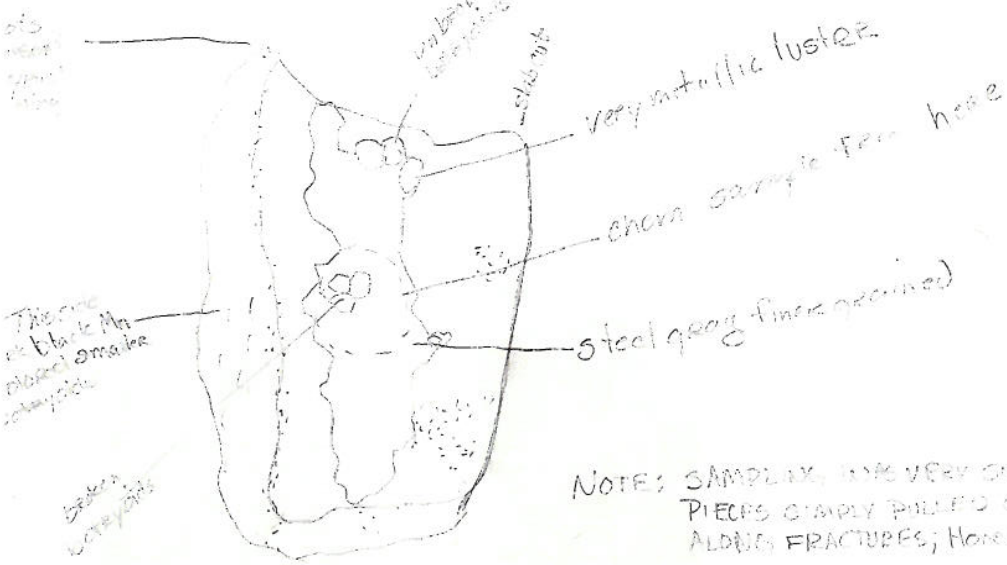
Rock type: Mn layered crust, with incorporated [illegible] volcanic clasts. Clasts vary in size from 5cm to 2mm. Large clasts have Mn crust of 1mm. Outer crust is botryoidal. Rust colored to ochre colored staining (material?) on areas outside. Volcanic clasts have altered. Cannot tell if piece was broken off or picked up off ocean floor. Steel gray botryoidal deposit occurs on bottom (hydrothermal?). Has a metallic luster where botryoids not broken. Is finer grained than the rest of the Mn. Where botryoids are broken a honeycomb appearance becomes apparent (like basaltic columns). See Back

Description:

Mineralogy (XRD): ____

Analyses and subsamples:

analysis:	analyst:
Mn chem on steel gray sample off large slab.	M. Morrison 10-2-87
XRD of above	



NOTE: SAMPLING WAS VERY SIMPLE
PIECES SIMPLY PULLED OUT
ALONG FRACTURES; Honeycomb pattern still evident

Large Piece

broken botryoids with "columnar" "honeycomb" texture

metallic luster unbroken botryoids

Mariana Is TT-192
D56-4 Bottom of Sample

SAMPLE DESCRIPTION

Cruise Id: TT192 Size: 19x10x6cm Location: NW Pacific Sea

Sample Id: D56-5 Weight: _____ Depth: 2[illegible]

Mn Crust Description

Surface Texture: _____

Mn Crust Thickness:

Min: _____ Max: _____ Ave: _____

Layers (Outer to Inner):

	Min	Max	Ave	Texture
1.				
2.				
3.				
4.				
5.				

Mariana Islands

D56-5

Comments and XRD Mineralogy:

[illegible] which appears to have penetrated cracks & through pumice. Sand and [illegible] cemented into Mn

Top of sample may have some hydrogenous influence

ANALYSES

I think these are buried upside down

Substrate Description

Rock Type: _____

Description:

SAMPLE DESCRIPTION

Cruise Id: TT 192 Size: 12 x 13 x 2.5 cm Location: NW Fukutoku Seamount

Sample Id: D56-6 Weight: <1 kg Depth: 1250-1500 m

Mn Crust Description

Surface Texture: smooth to botryoidal

Mn Crust Thickness:

Min: patina Max: <2 mm Ave: 1 mm

Layers (Outer to Inner):

	Min	Max	Ave	Texture
1.				
2.				
3.				
4.				
5.				

Mariana Islands
D56-6

Comments and XRD Mineralogy:

Very thin coating of Mn

Substrate Description

Rock Type: Mudstone

Description:

Bioturbated mudstone w/ fractures filled by Mn, burrow fillings also seem to have more Mn in Mud

ANALYSES

SAMPLE DESCRIPTION

Cruise Id: TT192 Size: 11x10x5.5 cm Location: N.W Fukutoku [illegible]

Sample Id: D56-7 Weight: 1kg Depth: [illegible]

Mn Crust Description

Surface Texture:

Mn Crust Thickness:

Min: Max: Ave:

Layers (Outer to Inner):

	Min	Max	Ave	Texture
1.				
2.				
3.				
4.				
5.				

Pumice Clast

Mariana Islands

D56-7

Denser Mn Layers

Comments and XRD Mineralogy:

Very similar to D56-5

Hydrothermal(?) Mn through & around pumice sand and forams incorporated into Mn

Bottom of Sample has Dense Hydrothermal Mn

ANALYSES

Substrate Description

Rock Type:

Description:

SAMPLE DESCRIPTION

Id: TT192 Size: 14x10.5x5.5 cm Location: NW Fukutoku [illegible]

Sample Id: D56-8 Weight: 1kg Depth: 1250 - 1500 m

Mn Crust Description

Surface Texture: Top is botryoidal, bottom grainy

Mn Crust Thickness:

Min: patina Max: 2mm Ave: 1mm

Layers (Outer to Inner):

	Min	Max	Ave	Texture
1.				
2.				
3.				
4.				
5.				
6.				

Mariana Islands

D56-8

C[illegible]nts and XRD Mineralogy:

Top is hydrogenous w/encrusting foram.

Bottom has hydrothermal Mn which looks as if it is migrating into mudstone.

ANALYSES

Substrate Description

Rock Type: Volcanic Breccia w/ mudstone matrix

Description:

Described By: JSM Subsampled By:

SAMPLE DESCRIPTION

Id: TT192 Size: 11x8x3cm [illegible] Location: NW Fukutoku

Sample Id: D56-9 Weight: 2 kg Depth: 1250 - 1500 M

Mn Crust Description

Surface Texture:

Mn Crust Thickness:

Min: Max: Ave:

Layers (Outer to Inner):

	Min	Max	Ave	Texture
1.				
2.				
3.				
4.				
5.				
6.				

Mariana Islands

D56-9

C[illegible]nts and XRD Mineralogy:

Various examples of hydrothermal Mn. Some Mn Sandstones. One [illegible] several pieces have hydrogenous crust (<2mm) on them

ANALYSES

Substrate Description

Rock Type: [illegible]

Description:

Described By: JSM Subsampled By: