DATE: 19 August 1984 SAMPLE:
CRUISE ID: SO 33 58 DK Box dredge
LOC: VII
AREA: E

	time (GMT)	LAT (N)	LON (W)	water depth (m)	wire o
ON BOTTOM =	2213	15° 35' 23"	169° 12' 32"	1322	156
OFF BOTTOM =	2305	15° 36' 04	169° 12' 31"	1394	151
mean dredge data (corrected):		15° 25' 30"	169° 12' 24"	1332 (728 fm)	

time on bottom = 52 min

RECOVERY WEIGHT = total 100 kg crust 30 kg

CRUST THICKNESS = 0.5 – 6 cm Avg 2.5 cm
Germans = (4 cm)
2 generations

SUBSTRATE = hyaloclastite, breccia cemented w/ phosphate

COMMENTS: 2 large boulders covered w/ knobby crust largest = (75 x 35 x 25 cm)

* Bio sample
* microbio sample

* confidential

58 DK

Sample Description

Cruise I.D: S033

Sample I.D: Sta: 58DK

Location: "Keli" Rid
15° 25'30" N
169° 12'24" W
(-) 1332 m.

Size: _____ Weight: _____

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: _____

Mineralogy (XRD): _____

Associated alteration, phosphorite, or hydrothermal deposits: _____

Substratum:

Rock type: _____

Description: _____

Mineralogy (XRD): _____

Analyses and subsamples:

analysis:	analyst:

1	2
Rock Type: Basaltic Hyaloclastite	Basaltic Hyaloclastite Breccia
Color: light brown (5YR 5/6) →	-do- (matrix, white (N9) cement)
Texture: pyroclastic	clastic
Matrix: Basaltic glass shards, ± 60% " rock fragments, ± 10%	Basaltic hyaloclastite derived from 58 DK 1 } ± 60%
Cement: phosphorite, ± 20% zeolites, ± 10%	partially phosphorized foraminiferal chalk, ± 40%
Average grain size: ± 0.75 mm (Range: sand to gravel size) →	± 15 mm (coarse gravel to small pebble size)
" grain shape: angular	subangular
Sorting: poorly sorted →	-do-
porosity: ± 60%	± 40%
permeability: ± 50%	± 30%
Alteration: complete (oxidation, zeolitization, smectitization, hydration, phosphorization) →	partial — complete -do- (partial phosphorization of cement)
Remarks: very similar to both 57 DK 3 and to 57 DK 1; weakly cemented like 57 DK 1; with great disparity of grain sizes like 57 DK 3. Cement not homogeneous throughout the rock; in some places phosphorite dominates; in others, zeolites. It is likely that this rock may have had the same origin as that from the previous four dredges; serves as substrate for manganese oxide encrustations ± 30 mm thick (warty, knobby); some pieces are like giant deep sea nodules: the "nucleus" is formed of a clast of hyaloclastite with no crust all around, thick on upper	large pebble to large cobble-size clasts composed of smaller fragments of hyaloclastite cemented by foraminiferal chalk; developed on surface of hyaloclastite outcrop by mechanical weathering; the framework clasts do not serve as substrate for encrustation by manganese oxide (rapid deposition and cementation); the breccia itself serves as substrate for deposition of ± 3 cm thick encrustation of ferromanganese oxides

typical of [illegible]

Sample Description

Cruise I.D: S033

Sample I.D: Sta: 58DK

Location: "Keli R. dge
15° 25' 30"
169° 12' 24" N
(-) 1332 m.

Size: _____ Weight: _____

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: _____

Mineralogy (XRD): _____

Associated alteration, phosphorite, or hydrothermal deposits: _____

Substratum:

Rock type: _____

Description: _____

Mineralogy (XRD): _____

Analyses and subsamples:

analysis:	analyst:

3	4
Rock Type: Chalk - Phosphorite	Foraminiferal chalk
Color: Very pale orange (10YR 8/2) [usually stained externally by $Fe(OH)_3$ to dark orange or orange-brown colors] →	White (N9) to medium dark gray (N4)
Texture: microgranular →	granular
Matrix: Globigerina(?)/Globorotalia? test remnants an "ghosts" left by phosphorization process, 15-20% →	do - 50-100%, ±0.25 mm dia. ferromanganese microconcretions, ±10%, 0.2 manganese oxide dendrites, variable size ±0-
Cement: Phosphorite (francolite?) 80-85%	Calcite, phosphorite(?) — not determined
Average grain size: < 0.010 mm range: 0.005(?) — ±1mm) →	± 0.20 mm
" **grainshape**: round - acicular(?) (possibly in the phosphorite) →	round, equant
Sorting: well-sorted (prior to phosphorization) →	well-sorted
Porosity: ±5% →	± 80%
Permeability ±1% →	± 80%
Alteration: extensive - nearly complete (phosphorization of calcite; oxidation of siderite components of tests) →	superficial(?) (replacement of calcite with francolite?)
Remarks: fragments and clasts in the pebble range perhaps dislodged from breccia deposits. bed thickness not determined but forms, in places laminar deposits up to 1cm thick capping hyaloclastite, which is, in turn, capped by dendritic (internal morphology) botryoidal (external morphology) single generation ferromanganese deposits. the rock is quite hard and well on the way to complete phosphorization.	pebble-size clasts penetrated to varying degrees and in different spots by manganese oxide dendrites (more numerous peripherally). mottled appearance internally due to penetration by MnO_2(?) dendrites. pebbles look water-worked, serves as cement for 58DK2, often found, like phosphorite, as a layer between hyaloclastite and Mn-oxide crusts