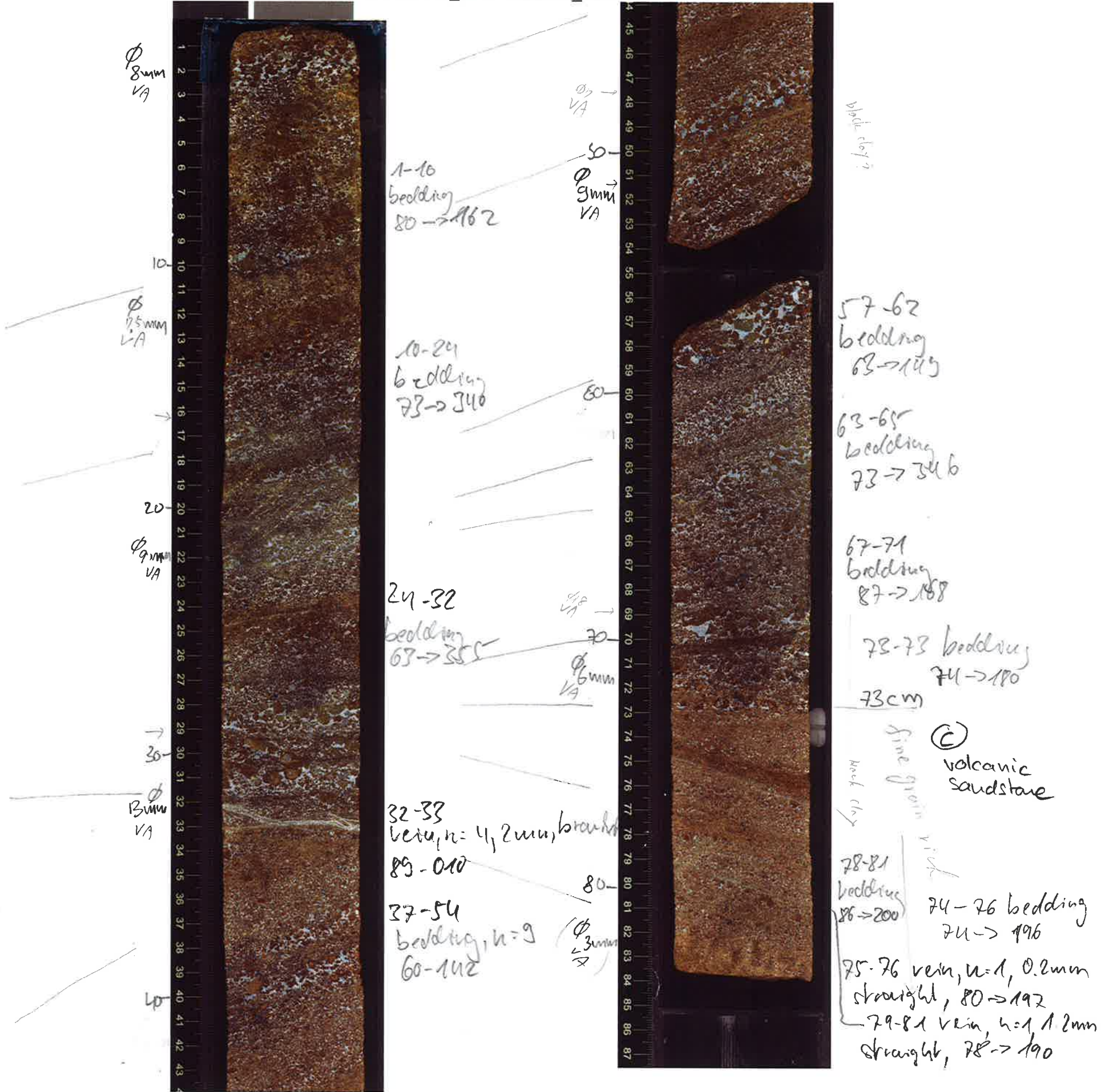


(A) continue

330-U1376A-3R-1-A\_SHLF2876341\_20110128094727



© continued

φ2mm  
VA

10  
φ6mm  
VA

20  
φ4mm  
VA

30  
φ5mm  
VA

40  
φ5mm  
VA

50  
φ6mm  
VA

60  
φ7mm  
VA

70



0-1 vein, n=6, 2mm  
branched, straight  
1-2 vein, n=4, 2mm,  
straight, branched  
81 → 120  
5-6 bedding  
85 → 360

15-18  
bedding  
90 → 356

24-32  
bedding, n=5  
90 → 360

35-43  
bedding, n=8  
85 → 170

43-49  
bedding, n=6  
80 → 160

49-57  
bedding, n=4  
88 → 166  
49-56 vein, n=1, 0.1mm  
irreg., 42 → 309

59-66  
bedding, n=5  
80 → 322

φ4mm  
VA  
80-  
φ3mm  
VA

90-  
φ3mm  
VA

φ 100  
35mm  
VA

φ 110  
φ6mm  
VA

120-  
φ3mm  
VA

130-  
φ3mm  
VA



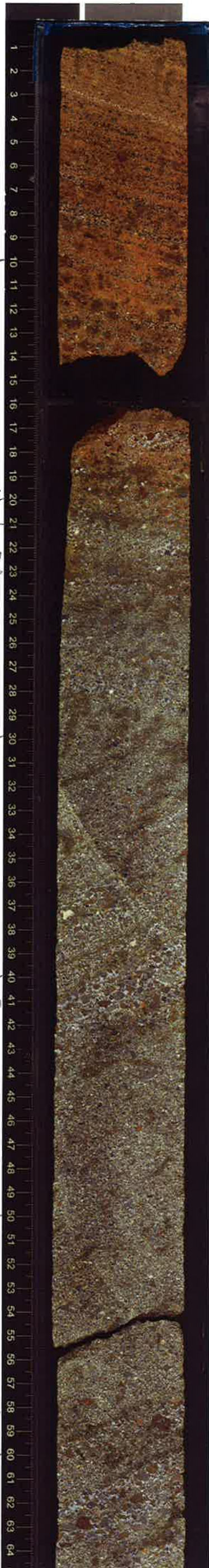
24-77  
bedding  
75 → 176  
78-88, bedding  
n=12, 81 → 340  
P1-89, vein, n=2, 0.4  
branched, straight  
80 → 255

94-100  
bedding, n=3,  
80 → 195

117-118  
vein, n=1, 0.2, straight,  
83 → 182

129-139  
bedding, n=11  
76 → 109

© continued  $\phi$  6mm VA



10  $\phi$  5mm VA

(A) volcanic breccia WITH BIOCLASTS (alga)

30  $\phi$  7mm A

40  $\phi$  9mm SA

50  $\phi$  7mm VA

60  $\phi$  7mm A

1-19 bedding, n=18 79 → 199

20-21 bedding, 82 → 010

39-43 bedding, 61 → 329

60-64 bedding, 69 → 341

30  $\phi$  8mm VA

30  $\phi$  7mm A

83.5 cm

86 cm

30  $\phi$  3mm VA

88 cm

100  $\phi$  4mm

103 cm

108.5 cm

110  $\phi$  1mm

110  $\phi$  3mm

120  $\phi$  1mm

120  $\phi$  1mm



67-71 bedding, 70 → 332

(A) 83.5-86 bedding, 90 → 182

(D) volcanic sandstone / ash tuff

(A) bioturbation, mud clast or compaction figure

(D) ash tuff

103

(A)

(D)

Pyrolusite (?) dendrites moderately bioturbated

1  $\phi$  1mm SA  
 2  
 3 (D)  
 4  
 5  
 6 7cm  
 7  
 8  
 9  
 10 16  $\phi$  9mm VA  
 11  
 12  
 13  
 14  
 15 (A) Fining upward  
 16  
 17  
 18  
 19  
 20 20  $\phi$  2mm VA  
 21  
 22  
 23  
 24  
 25  
 26  
 27  
 28  
 29  
 30 30  $\phi$  0.1mm (D)  
 31  
 32  
 33  
 34  
 35  
 36  
 37  
 38  
 39  
 40 40  $\phi$  0.1mm  
 41  
 42  
 43  
 44  
 45  
 46  
 47  
 48  
 49  
 50 50  $\phi$  0.1mm  
 51  
 52  
 53  
 54  
 55  
 56  
 57  
 58  
 59  
 60 60  $\phi$  0.1mm  
 61  
 62  
 63  
 64  
 65  
 66  
 67  
 68  
 69  
 70 70  $\phi$  0.1mm  
 71  
 72  
 73  
 74  
 75  
 76  
 77  
 78



2-7 bedding  
 72  $\rightarrow$  171

convolute bedding

18-19 u=2 bedding 83  $\rightarrow$  352  
 20-25 bedding, u=4 89  $\rightarrow$  352

annelid  $\rightarrow$

27-31 bedding, u=3  
 82  $\rightarrow$  351

brings  $\rightarrow$

33-37 bedding  
 85  $\rightarrow$  345

rudstone

37-40 bedding 83  $\rightarrow$  353

46-48 vein structure, u=9, 2mm, non-ore

rudstone

60-63 bedding  
 90  $\rightarrow$  187

solitary corals

71-73 vein, u=1, 0.1mm  
 irregular, non-oriented



80  
 81  $\phi$  0.1mm  
 82  
 83  
 84  
 85  
 86  
 87  
 88  
 89  
 90  
 91  
 92  
 93  
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 147  
 148  
 149  
 150  
 151  
 152  
 153  
 154  
 15

89-90 vein, u=1, 0.1mm  
 irreg. non-oriented

92 (E)

BOUNDSTONE  
 algae  
 solitary corals  
 bivalves

algal encrustation

101 cm gaps 182°



algal encrustation

shell

gastropod?

algal encrustation including rudstone part



⑤ continued (boundstone)

white pure LS

algal encrustation

rudstone facies

encrusting form

rudstone facies

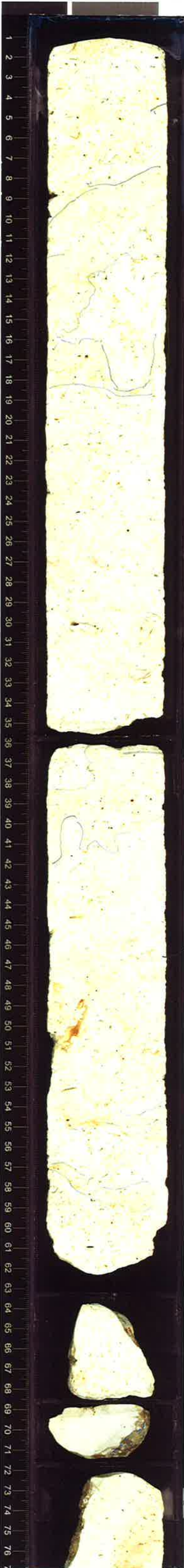
bivalve dissolution?

encrusting form

encrustation

encrustation

rudstone facies



encrusting type

rudstone



rudstone

algal framework

u7-u7 geopetal  
→ 180°

coral



coral

MBIO

branching form

rudstone facies

coral form

algal framework

rudst.

rudst.

framework

(E) continued  
(boundstone)  
pure limestone  
continue

"pinkish  
micrite"

algal  
framework?

algal  
framework

limestone  
fossils

branching  
form

algal  
framework

branching  
form

limestone



Gastropod

branching

crustacean

shell

algal  
framework

branching  
form

60.5cm geopetal 180°

algal  
framework

algal  
framework

limestone

branching

crustacean

shell

limestone

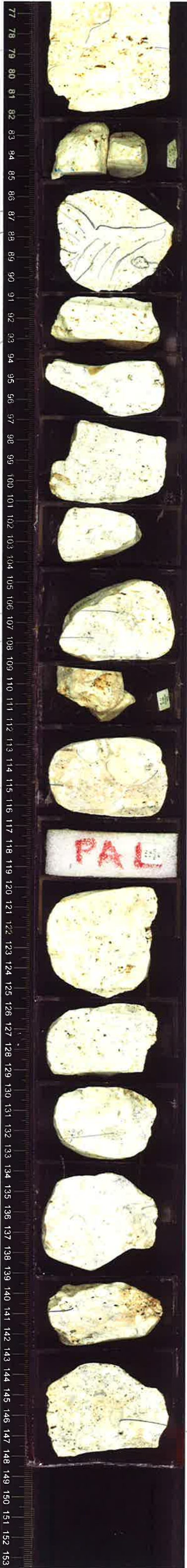
branching  
form

algal  
framework

porous  
shell

branching  
form

limestone  
fossils



algal  
framework  
limestone

porous  
shell

algal  
framework

PAL

13cm geopetal (in rotated  
piece)

algal  
framework

branching?

~~basalt  
sand grain rick  
don't have  
to below??~~

porous  
shell

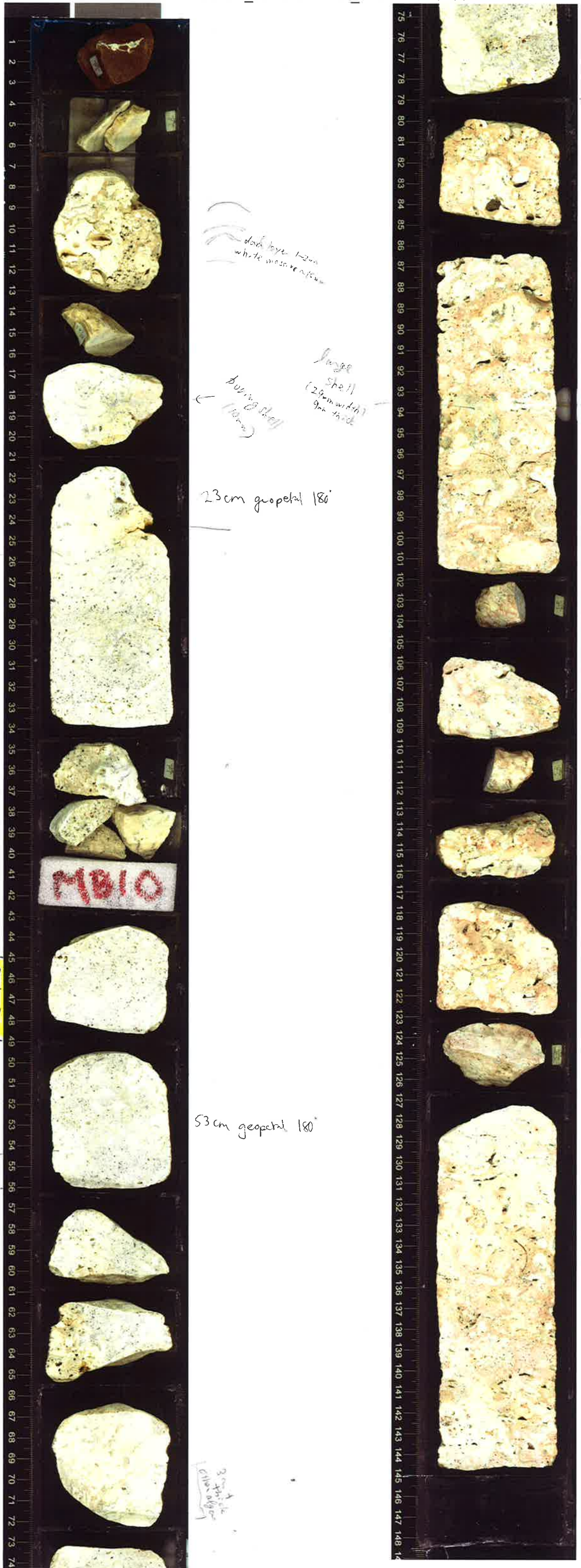


algal fragments  
with pinky micrite  
~35mm Algal limestone fragments

abundant  
dissolved bivalves  
& gastropods shell



4R-1



ds ep-m

coralline algal  
boundstone  
(~rudstone)

inter-algal bioconstruction  
algal fragment & basalt grain  
filled with micrite  
cement  
on micrite  
with void

gastropods, bivalves  
solitary corals  
→ usually dissolved  
many boring in algal mass

algal  
encrustation  
rudstone

dark layer 1-2cm  
white micrite

Large  
shell  
(29mm width)  
9mm thick  
boring shell  
(10mm)

23cm geopetal 180°

53cm geopetal 180°

algal  
encrustation  
algal encrustation

3cm x thick  
boring  
algal

3cm x thick  
boring  
algal

rudstone

algal encrustation

pinkey part  
rudstone  
with dissolved shell



algal encrustation only

dissolved voids filled with azoic micrite

rudstone  
rudstone



shell fragment



boring

large dissolved shell? (24x18mm)

boring  
dimple

basalt grain  
moderately rich

large encrusted bivalve? 2cm width

dimple boring shell

dimple boring shell

micrite filled cavity

basalt grain abundant

Geopetal 180°

void: dissolution  
→ calcite rim fills?

strange void fill void  
bioclast with cement (no micrite)  
rudstone with micrite



119-120 geopetal  
→ 180°

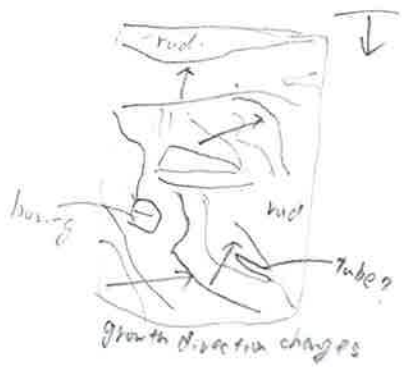


not same with those of 3R-5 & 6

'branching' growth  
baffle basalt + sand grains

rudstone part with shell fragment





5 geopetal 180°  
geopetals 6-6  
→ 180°  
geopetal 7cm - 180°

shell (remains) void infill  
by micrite  
→ micrite

Void fill  
with yellow  
micrite  
→ void

bung  
6mm

bung shell  
4.5mm  
abundant

yellowish  
"palm form"

encrusting  
form

shell fragment  
Pchinoid spines

yellowish  
"palm form"



encrusting form

large shell  
partly  
disintegrated  
large shell fragments

algal  
encrustation  
(module?)

"reddish" hematite?

pink  
algal  
encrustation  
bung shell  
6mm

104cm geopetal 179°

X15  
geopetal  
179°

6.9mm  
bung shell

algal encrustation  
with many bung  
shell

algal encrustation

algal encrustation

rudstone

algal encrustation

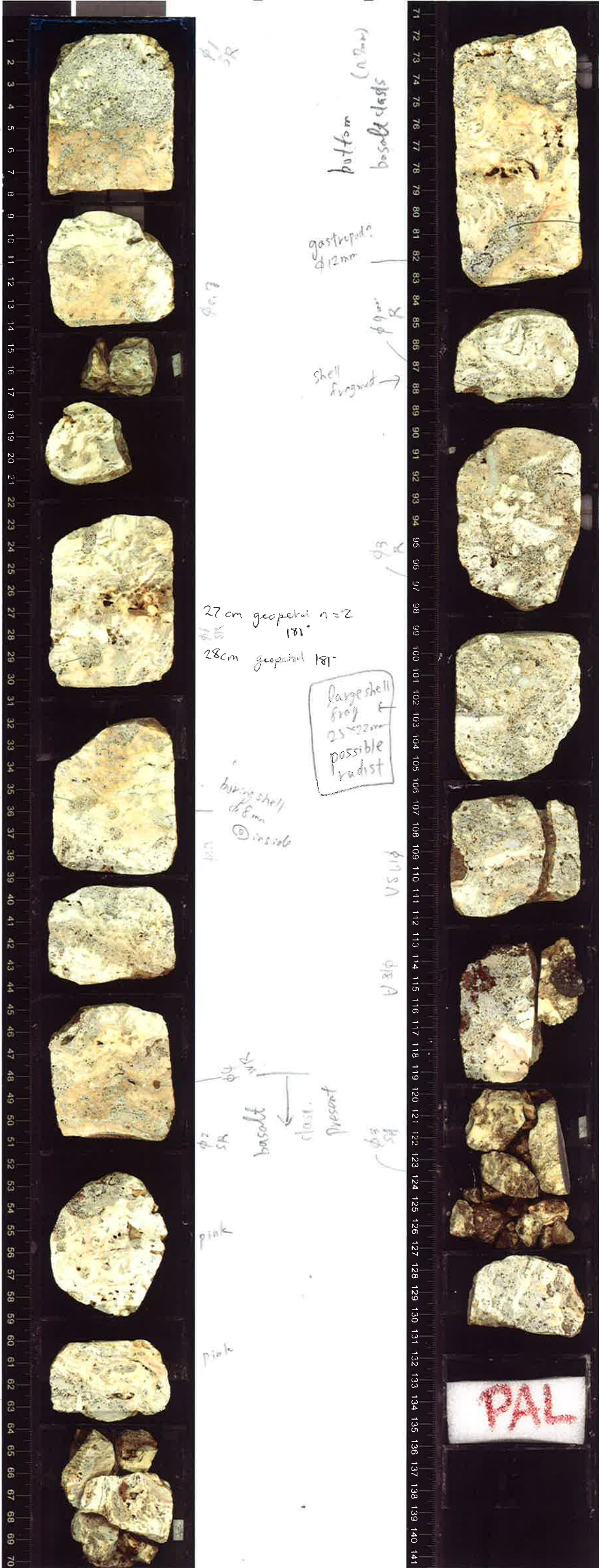
rudstone



algal encrustation

243

(continue)



encrustation  
 mudstone  
 encrustation

boring shell  
 (4.0mm)

boring &  
 inter-shell space  
 filled with micrite.  
 voids remains  
 boring shell  
 (3.5 x 8.6mm)

boring shell  
 4.9mm

shell  
 fragments

(Gastropod) →  
 void fill ← cement  
 micrite

VS  
 1/φ

bottom  
 basalt clasts  
 (n. 2mm)

gastropod  
 φ 12mm

shell  
 fragment →  
 φ 9mm

27 cm geopetal n=2  
 181°  
 28cm geopetal 181°

large shell  
 frag  
 25 x 22mm  
 possible  
 radist

boring shell  
 φ 8mm  
 ⊙ inside

basalt  
 clast.  
 present  
 VS  
 2/φ

pink

pink

73 geopetal  
 → 179°  
 77cm geopetal 179°  
 78.5cm geopetal 179°

coral

growth  
 direction  
 mudstone

"dissolved"  
 void present  
 filled with  
 micrite.

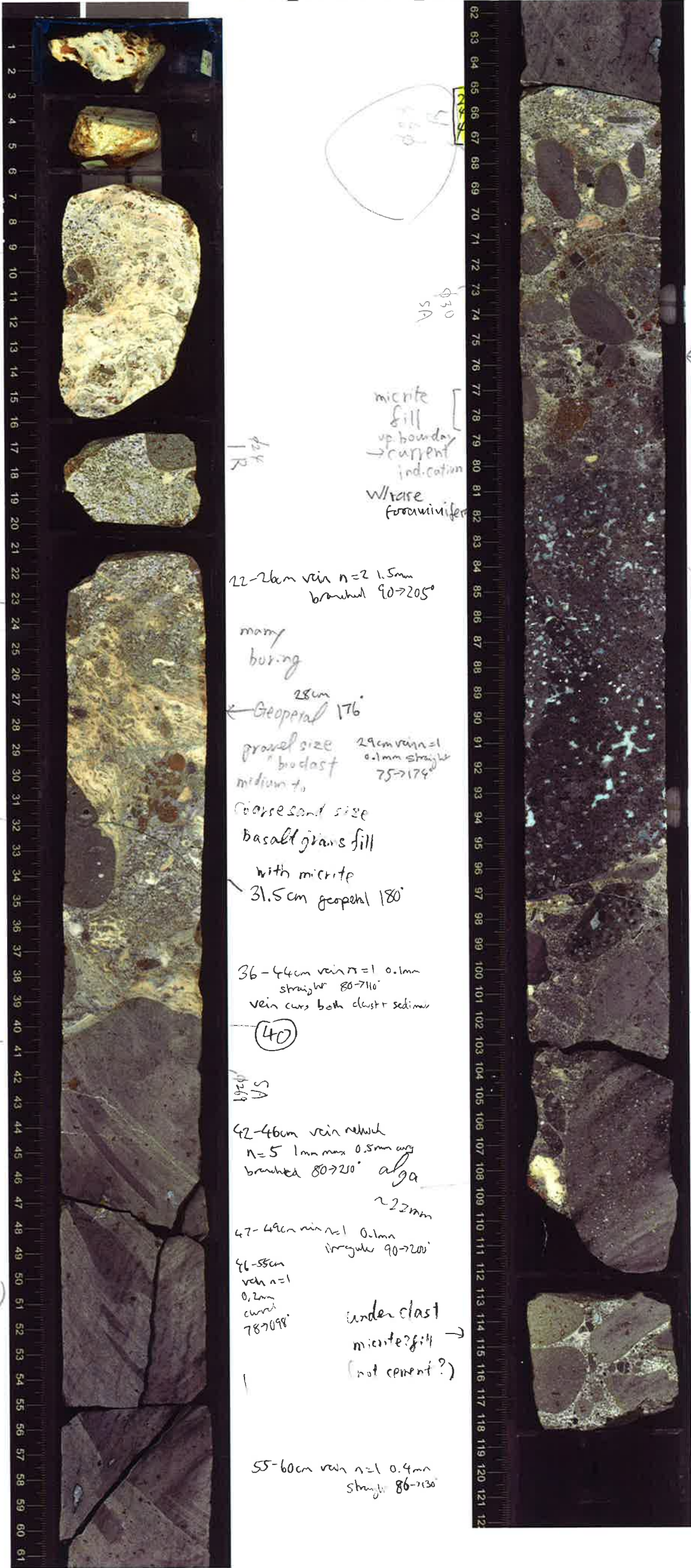
103 geopetal  
 → 180°

Basalt clast φ 17mm  
 SA  
 algal encrustation

Basalt clast φ 18mm  
 SA

pink ↑  
 ↓ algal  
 encrustation

PAL



algal encrustation

rudstone

algal encrustation

SA

bottom algal encrustation

dissolved gastropod



Start of the algal buildup!

Multicolored Basalt Conglomerate

inter-gravel space

- bioclast sandstone\*  
- micrite (m. v. sand)  
- cement  
clast - rounded

\* bioclast sandstone w/ volcaniclasts to volcanic sandstone at the base

bimodal clast size distribution



micrite fill  
up boundary  
current indication  
where foraminifer

22-26cm vein n=2 1.5mm branched 90-205°

many boring

28cm Geopetal 176°

gravel size bioclast medium to coarse sand size basalt grains fill with micrite

31.5cm geopetal 180°

36-44cm vein n=1 0.1mm straight 80-110°  
vein cuts both clast + sediment

(40)

42-46cm vein network n=5 1mm max 0.5mm avg branched 80-220° alga

47-49cm vein n=1 0.1mm irregular 90-220°

46-55cm vein n=1 0.2mm curved 78-109°

under clast micrite fill (not cement?)

55-60cm vein n=1 0.4mm straight 86-130°

47-65cm magmatic foliation (in clast) 90-310°

bedding?

69-73cm erosional boundary 90-146°

71-73cm vein n=1 1mm curved 75-134°

bedding?

shell frog

82cm geopetal 174°

83cm geopetal 180°  
83.5cm geopetal 188°

91.5cm geopetal 176°

96-98cm vein n=1 0.3mm straight 70-200°

\* Veins cut both clast + sediment

97-102cm vein n=1 0.1mm straight 30-240°

CONTINUE  
Heterolithic  
Basalt Conglomerate

- m.-c. sand  
fill  
- cement

xenolith →

φ 68  
5R

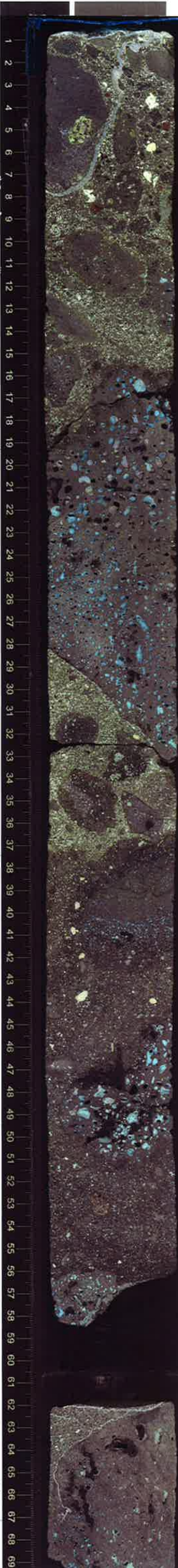
φ 43  
1R

φ 111  
VA

φ 99  
VA

φ 76  
A

φ 51  
A



1cm vein n=1 2mm straight  
86→174

1-8cm vein n=1 3-2mm  
curved 30→120

algal  
fragments

φ 72  
5A

φ 73  
5A

φ 60  
5A

φ 64  
5A

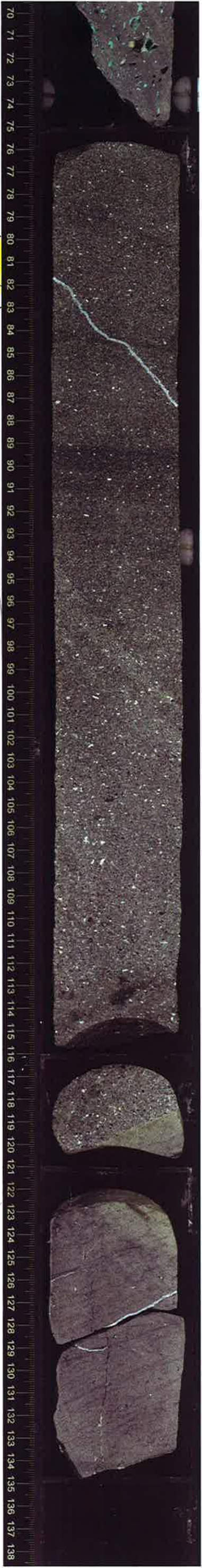
φ 123  
block

126cm  
vein n=1  
0.3mm  
74→166  
straight

74  
82cm vein n=1 1mm  
curved 70→358

69-74cm vein n=1 0.5mm  
curved and slightly  
straight

↑  
piece upside down



basalt sandstone  
with bioclast (small)  
c. ~ v.c. sand  
cemented

71-81cm bedding 74→020

82-87cm vein n=1 2mm curved  
90→214

84-85cm bedding 75→015

89-90cm bedding 74→010

subhorizontal  
layering?

coarse

v.c. sand-granule size

123-135cm magmatic foliation  
(in clast) 75→160

123-135cm conjugate vein n=1 0.2mm  
straight 40→270

127-129cm vein n=1 1mm straight  
70→156

134-135cm vein n=1 1mm straight  
80→166

cemented ↑  
Bottom



finer clastics fill  
bioclast rare  
c. sand-granule size  
angular

cemented  
m.-c. sand size  
rounded.

Basalt  
Boulder

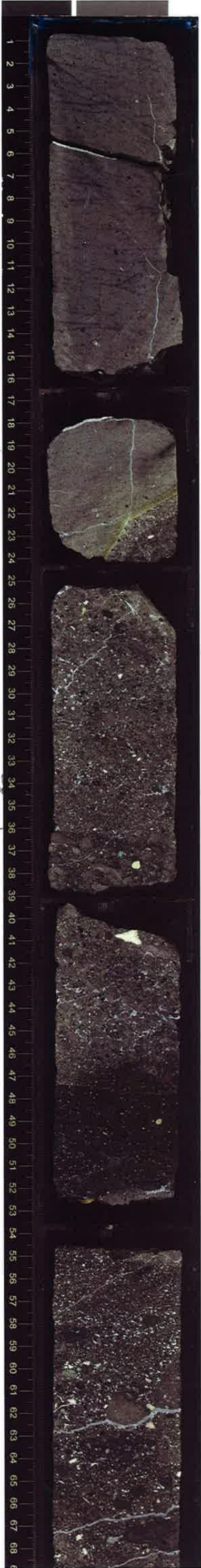
Basalt  
Sandstone with bioclast  
C. sand- pebble, rounded  
partly cemented  
partly fine clastics infill

erosion

36 mm

9p

9p



9p

9p

9p

9p

9p

9p

Geopetal  
(two layers)  
infill



933  
VA

abundant  
algal fragments

931VA

algae???

Needs to check sheet-like organism

Geopetal possible rudist

possible rudist  
bottom shell surface

937  
VA

Coarse sand size  
volcaniclasts  
& bioclasts  
filled & calcite cemented

Some clasts - well-rounded

937  
VA

bottom patch  
erosional  
contact

heterolithic  
basalt breccia  
fine clastic fill

922 = wavy  
metastatic hyalu  
breccia

Continue