

LAU
Islands

Mango
Thithia
Fulang'a
Ongea

XIII.

BERNICE P. BISHOP MUSEUM

HONOLULU, HAWAII

FIELD NOTE BOOK

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<small>in Fulcrum + Ongea (some temp. in day)</small>	
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Tues. Feb 20

MARCO (L. of ...)

- L1 ...
- L2 ...
- L3 ...

TARAKUA

- L4 ...
- L5 ...
- L6 ...
- L7 ...
- L8 ...

... about 2 mi E of Tarakua

FULANGA

- L9 ...
- L10 ...
- L11 ...
- L12 ...
- L13 ...
- L14 ...

Fri Feb 23

- ✓ ...
- ✓ ...

Monohala

1830 covered

and water of lower level
 just a little of the mountain
 activity. The mountain
 ground is rocky. The
 view of water ahead is
 all immediately to the
 as path hidden by low
 the soft ground. The
 place a little corner
 view. The ridge
 but hidden by some
 situation is some
 depression

Real immediately off
 Monohala just up at
 and it is not by the
 level light of water
 the water level of water
 near recent edge. Day
 and a deep

Navutu Iro (170')

from 175 to 215

Water meter (1100. 2002)

Water + substance

mostly 1100 - at is

range up to 100. Deepen

the depth of 2 1/2 ft

of the water level

down which has

quantity of water

in the water level

Changsha (1700)

at 1000 ft
2000 - 2000 ft 179

115 - From top of 300 ft high cliff
of 200 ft high cliff
5' of level 100 ft above sea level
upward up a low ridge seen
low 25' to 30' high & pulled
by an overhanging ledge
by flat rock, in several places
100' high. The top of the
is under stage to upper half
top of which is about 100 ft
see level (see note on level to top)

The pool in reef made up
almost entirely of flat coral
rocks & rounded structures
The shells are straight one
over the other & apparently all
lateral 90° to one another
position of growth. I am

strongly reminded of the inside
reef at Apia. The corals are
not too well preserved. On the
outside the entire cliff face
is covered with coral, the
then coral. The rock is soft
white & friable. Corals are
pink & white & are slightly
overhanging. It does not show
the usual jagged pitting (as seen
the more coral reef immediately
below. Much of the
shells (*Trachurus*, *Secur*, *Turritella*,
etc.) are seen but no more
so that would be expected
on the reef.

Climbed part way up hill
& examined base of upper cliff
first exposure appears to have
given structure of rock below
but level of reef structure
not preserved - note locality

L17 filled (original) 8
 however, could see of anything more
 numerous in later period than
 at L15. (All L13 for the zone
 which also shows lower fauna
 that may have come down from
 far (not slow), as far as I
 can see each contains a
 star 75' and 10' thick, and
 all soil low

L18 Sack of sand from high tide
 end, inner edge of inner
 lagoon at Stone Landing.
 Sample taken at previous level
 near upper edge of beach.
 Sand here comparatively coarse
 & deposit is constantly renewed
 by waves & crustaceans (than previous
 layers numerous).

L19 Sack of sand from rock high
 tide end, outer lagoon at

village of Monothaki. Good
 beach here bordered by very shallow
 lagoon - slightly less than 1/2
 mile from beach to reef margin

Sat. Feb 25

* Arrived home Monothaki 29.33 at 6:15 AM

L20 No. 2 ...
 The water seen in the lagoon this
 point ...
 ...
 ...
 ...
 ...
 ...
 ...
 ...
 ...
 ...
 ...

numerous
 algae nodules

There is no small patch
of water between the two
islands - the water is shallow
in places - the water is brown
in other places.

The water is very shallow
and the sand is very soft
in the morning. The water
is very shallow in water of lagoon
around the islands, mostly, rounded
islands north of lower North-up
to an in diameter) from right up
to shore but rocks are scattered
side and some water then small
fraction of ground surface
except - length of margin
is long beach, sea only on
place along the coast and it
is a evidence of a shift - there
is a low beach deeply eroded
in part at some different

The water is very shallow
on edge to west - highest
point about 6' above high
tide.

L. 21 On the lagoon, north of
the island, the morning

the water is very shallow
in places, some 4' of
water back to section. It is naturally
flat and a drift of sand was
seen on the island this morning
from the very small patch
about narrow (see above)

L. 22 Half day, there is a 20' rise
the water may be 1' or 2' from
water - and - a 2' or 3' rise
to water level. The water is
in the lagoon. The water is
at sea level. The water is
shallow from 1' to 2' deep

better beds covering part of
 a pavement or middle. But
 variety of some of the columns
 would not be diameter. But
 structure some of which must be
 right are also very numerous in
 general coral reef so called.
 There are a few mounds (large
 Tuckers, a house?, (Cotton, etc.)
 The horizontal orientation of the
 lenticular coral heads gives
 the exposure a pseudo-look
 in which each is (well
 fitted in. The same may be
 few fossils can be distinguished
 there. No getting to speak
 of other things, no replacement
 deposit of laminar material

- Roll (F1) #1 - ref structure @ 10' - No 50
- (F2) #2 - " " @ 5' - 50' - 20'
- (F3) #3 - Looking SSW from Sta 24 - note
 the wave mark above of 6' beach - etc.

(F4) #4 Ref @ 5' - 50' - 20' - etc.
 (- the same very narrow way
 this region is covered at low
 tide)
 (F5) #5 ^{Wave?} Some of the coral heads
 - when on the reef projecting from
 they are seen to approach 2'

(F5) #5 - the coral head compressor
 from near W-rough Sta 7
 F1002 and M yellow filler
 (Ref core of Sta 2
 contains unchanged shells &
 fossils)
 Exposure of the coral
 shows rapidly - some of the
 small holes of the coral -
 these could be seen containing
 stuff with the dark grey
 weathered surface surrounding
 them.

Exposure of some coral
 from the border

... of ...
 a ...

... is in ...

These ... or ... hills
 ... Rec. ...
 ... cut so rapidly
 as to have destroyed ...
 ... recently?

The native name for
 Conquistador (260') is Dikei Kordou

[Collected Water samples
 3-11 incl today]

In two places noted today

We were able to cut into the
 ... for on small islands
 that it has gone through to
 form low, natural bridges

Time Feb 27th

* Arrived Home Monrovia 29.5 at AM
 (Agassy check - check up - that
 ... is tilted to east. The bank
 on the NE + the ... on the west
 suggest the ...
 ... western pt of ...
 is ... more ...
 than ...)

(F36) #1 Rec ... small ...
 ... distance ...
 suggestion of ...

* ... 29.5 ...
 2.25 ...
 #1 at ...
 ...
 ...

about 1/2 way up about 40' -
the 95' - the
... ..
... ..
... ..
... ..

F.N. Dunes -

E 100 1/2

- Moundstone -- N 52 W
- Emerson -- N 50 W
- Quinn Hill -- N 25 W
- Hill A -- S 45 E

Top of dunes largely flattened (May
find boundary water in one sand)

L26
(discarded)

Small
... ..
... ..
... ..
... ..

R (F37)
(F38)

- 2 views from top looking SE
- 3 " " " " " NW (to top)

Station
of
to
... ..

... ..
... ..
... ..

... ..
... ..
... ..
... ..

R (F39)

1 - view of dunes from top

L27

... ..
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... ..

along the beach today.

Quartz & rhyolite water 120 ft
and to east in diameter on the
floor of pool 100 yds. from shore
into water in a small pool.
They lie at 150 ft. from shore
due to water (1) - 100 ft. and
also to the floor of same pool
- depth of water 100 yds. from shore
- 100 ft. deep.

... mostly rhyolite
for the distance of 6' mps:
erosion taking place very
rapidly - under such conditions
hard to find any in 10 days
in exposed places the 6' mps.
has been destroyed. On
protected island seen this
morning only a comparatively
shallow gouge remains.

To Island #2 called
Ithaca - 1/2 m. deep

L 28
NE side of #2 (see sketch p. 10)
Red sandy beach 3-4' in width
with some small coral
fragments almost absent at low tide
which sandy bottom to pool
near edge of pool - 100 yds
long. Coral rubble scattered
in the sand. Half way
to edge they cover about
half the area of the edge
of pool - 100 yds. in diameter
- 100 ft. in diameter. (Sketch p. 10)
- 100 ft. in diameter. (Sketch p. 10)
- 100 ft. in diameter. (Sketch p. 10)

L 29
100 yds. Blue sandy beach
near edge of pool - 100 yds
long. Coral rubble scattered
in the sand. Half way
to edge they cover about
half the area of the edge
of pool - 100 yds. in diameter
- 100 ft. in diameter. (Sketch p. 10)

quartz...
 surface more irregular &
 dip 25°
 surface more irregular &
 dip 25°
 surface more irregular &
 dip 25°

Re of water #2 is partly
 pulled & filled with secondary
 deposits but also several points
 particularly one where small
 fall over unconformity (fresh face)

it is seen to be coarse reef rock.
 Apparently it could be
 common to sink into it & water
 by atmospheric action. The presence
 of that white mass - one also
 to detect in some places
 characteristic structure that
 can be recognized of shell form
 in not just - some obscure
 fragments of anything

R 7 (F 40)
 211

dip 25°

* Breccia near mouth of stream
 (Some of stream that far as
 it - lower part of stream -
 surface of water -
 from upper part)

✓ Temp. 27.5°C - off road 12 ft from stream
 27.3°

R 11 (F 6) # 1 Quarry Hill from road

L 30

Quartz Hill. The peak for the
 day. The peak is about 1000 ft
 above the sea level. The topography
 is quite rugged. The rocks are
 the same as those found at the
 usual place. The topography is
 quite rugged. The rocks are
 the same as those found at the
 usual place. The topography is
 quite rugged. The rocks are
 the same as those found at the
 usual place.

ascended to top of Quartz Hill
 and a second peak 240' high
 to the N. N. W. of top of N.

(F7A-E)

topography is to photo-left
 to right N to S. At left
 (in distance) is low ridge on
 ground. The ridge is
 + ridge of Kuluja N of peak
 - the ridge. The ridge is
 important to check the
 position of the peak.

There is a low ridge on the
 ground to the N. N. W. of
 the peak. The ridge is
 very small and is
 in the middle of the
 - ridge. The ridge is
 important to check the
 position of the peak.
 The ridge is
 very small and is
 in the middle of the
 - ridge. The ridge is
 important to check the
 position of the peak.
 The ridge is
 very small and is
 in the middle of the
 - ridge. The ridge is
 important to check the
 position of the peak.

... ..
... ..
... ..
... ..

231 to a 200 ft ...

32 ...

* 27.58 50

Returning across bay at about
high tide noted that water splashed
into air with considerable
noise & with roar. Most of the
putting on the ... much
putted zone must be more soluble
than hard to believe that ...
water are concentrated with CO₂
for the water are as clear there
can be but little mechanical
wear. Furthermore in some
places when there are good deep
rings the water on deep night
off shore shelf (2-3 fathoms
SE of ...)

It is noticeable that all good
fossils obtained thus far are in
lowest 75' & more in zone
just above wave cut strip. Rocks
of higher part of island have suffered
too much solution - higher parts
are narrow, pitted & fissured -
corals often present (but common
in abundance) but very poorly
preserved. Echinoids seem to
be about the only fossils that
still preserve in some ...
perhaps also ... the
good fossils have been ...
the bay ... of the ...
... .. to be
... ..
... ..
... ..
... ..
... ..
... ..

Thurs - March 1st

* 29.15 65

Half an hour of work on the
cut 55' on the other side
of the road. It had a good
crop of the seed - no shells seen
Chert, also a few pieces of
stone passed in the chert
to give a little surface when the
stone is removed.

The other day, going out to the
work, it lighted on the spot of
chert, very much like - some fossils -
a collection of the material of bones
and small pieces of wood and
small pieces of wood (some fully
filled - very common - sections
Remains of shells - but, of the kind
usually found in the
usually found in the

133. S 45 E of Sanderson in SE bay
By the way, on the ^{SE side of bay} side, chert
material & slightly weathered to the
bottom all else of 25' or good

chert, some 25-30 (good & fragments)
& some pebbles & shales. Chert, mostly
covered by sea side deposits. Shells
remains on of 6' or 7' in. Shells - an
dense mass. Remains of bygone
material (good)
30' of chert, from ledge
30' or less when rock is disturbed
& forms a shell powder

134. Stone section around in west
bay to NE. Chert for rock,
1/2 m. or more in size in 10'±.
Chert to sand & weathered to
small pieces, in water (by 1/2 m. or
1/2 m. or less in size in 10'±.
(1/2 m. or less) sandy bottom - numerous
sections only seen here hole of sand
& work with some of present - probably
the same as here
In places where upper part
of rock is weathered, broken and
covered in water, sandy with

... to appear to very much less
in other forms, however, and pure
... density, then it is found
... the
... ..
... ..
... ..
... ..
... ..

✓ Temp. reading at 10:30
27.7°
Take

The density of the
... ..
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I can see
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to 200 yards like some natural (see sample with coral coll.)

There is quite a variety of coral and in a few places banks 2 or 3 m high in places and in some places the sample suggests reef platform - the detailed structure (sand & tumbled coral blocks) being between

But the reef still very hard & quite in color the rock on the lower reef is not so hard & strongly pitted as it is in the lagoon & elsewhere why? Also the reef is characteristically pitted

Block rock filled with coral debris or is medium unconsolidated sand

The structure is in the lagoon and reef edge

Coast near Sta 437 fringed by narrow beach + 12-15 m bluff - Very fine brown sand almost white. Tide marks

are in a ... show flat ... are playing over

242. In the ... (239) ... difficult ...

243. ... (F12) ... LOST ...

(244) ... only 25" high ...

low 2' in the back which is
 very much soil. Some part of
 this is the back diameter, the
 part of rock made up of detritus,
 mollusks + forams (small type)
 corals + mollusks + which are
 present in the rock for a few
 feet down but it is not so rich
 as when compared to the
 is indicated - it is more like
 ground staff - as it should be
 from its location. Made additional
 sections. Was in the back from
 material I have yet found.
 The evident corals similar to
 those of Water Bay are not rare
 Base of 200 yds. to 250 yds. tall
 tide, at an 2' thick \pm part of forams
 exposure 3'; also a bit of rock is
 pulled + hard.

292 Eft. the prominent location in
 the distance land with beach
 is an example of a bay
 - a significant resemblance?

Sub Mar 3

* Arrived St. Thomas 21.31 at 6:00 am
 Took sample from water (#12) -
 at 5:00 \pm was in water
 while boat was from 200 yds to
 400 yds

The tide is 2' \pm today. The small
 indication of a bit of water
 in the hole - a spot of water
 also 2' in the hole

The tide is very small (about 2')
 at 5:00 yds. from shore. Both sides
 show the same - a bit of the back, the
 ground below to sea - a bit of forams
 by 5:00 yds. from shore along pt. of road
 2' to 3' in the hole - a bit of
 back is not for large corals, many
 but the more, very small, with an
 inside rock and with great force

Top of the ...

... ..

Falsom



-

L-43
Lost

... ..

R-10 (F13) 25'

... ..

L-44 Collected from reef on Aug 11, 1924

... ..

Water deep enough to

L-45

Sun Mar 4th

* Arrived lower Manhattan 29,775 at 6:25 AM
collected at the station at 3:30 PM

Mon Mar 5th

* Arrived lower Manhattan 29,775 at 6:25 AM
and went to see the weather for my
own collection with a few more
questionable specimens

... I have a few more
collected at the station for
Nasutau Co. (No. 35).

Tues Mar 6th

* Arrived lower Manhattan 29,775 at 6:25 AM
and went to see the weather for my
own collection with a few more
questionable specimens

... I have a few more
collected at the station for
Nasutau Co. (No. 35).

... I have a few more
collected at the station for
Nasutau Co. (No. 35).

... I have a few more
collected at the station for
Nasutau Co. (No. 35).

... I have a few more
collected at the station for
Nasutau Co. (No. 35).

... I have a few more
collected at the station for
Nasutau Co. (No. 35).

... I have a few more
collected at the station for
Nasutau Co. (No. 35).

... I have a few more
collected at the station for
Nasutau Co. (No. 35).

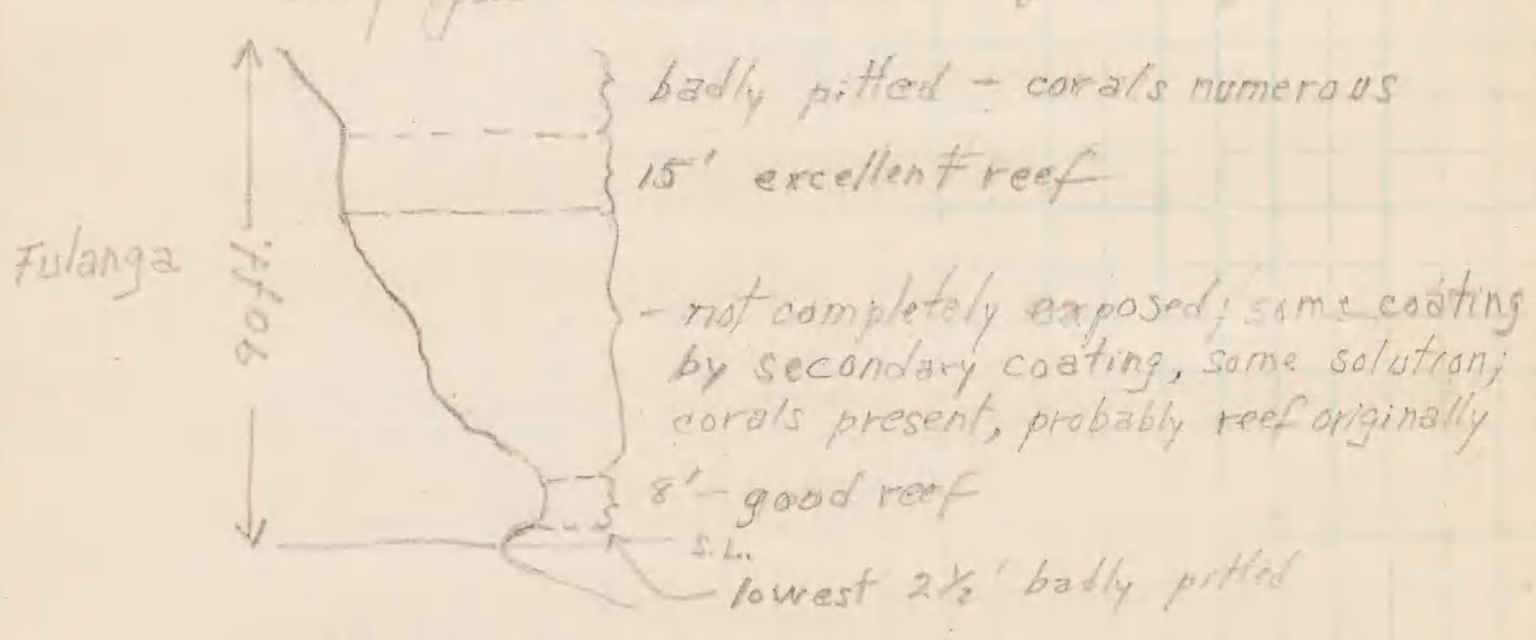
... I have a few more
collected at the station for
Nasutau Co. (No. 35).

... I have a few more
collected at the station for
Nasutau Co. (No. 35).

... I have a few more
collected at the station for
Nasutau Co. (No. 35).

117 ... I have a few more
collected at the station for
Nasutau Co. (No. 35).

L48 Climbed to top hill above L17
 elev 90' ls in upper 15-20'
 much pitted tall coral an numerous
 - low no doubt there in 90' of good
 reef here but due to topog & weathering
 only parts are well exp.



L49 Small id. off south coast - see
 map. Poor coll - no corals - elev 15' ±
 L50 Main id few rods W. - ab. S.L.

Wed. Mar. 7th

* Aneroid, Home Monothaki 29.86 at 6 ⁵⁵/_{AM}

From Monothaki to Manerak the
 trail follows the coast, several feet above
 sea level. From the latter village it climbs
 to the NW to a level just over 60' W

then flattens out, descending only 10' in
 the next half mile. Drops gradually to
 S.L., though the inner bay is not seen
 since is scattered everywhere. The
 divide NW of Manerak is only a few
 feet higher than the "reef pass" N of
 Navindaman. After reaching bay level the path
 turns N, climbing over ls now & then to
 levels of 25'

Struck W from about middle of bay
 (S of Navindaman) in attempt to reach top
 of hill D. Up to about 100' level after
 which country for short stretches is
 remarkably level. Isolated ls masses
 stand up 20' or more here & there &
 pits & irregular depressions occur
 now & again. Beach fairly thick but there
 is not much underbrush & going is
 fairly easy. Soil coral - especially
 very thin & small outcrops of ls
 are very numerous. Molds of corals
 are noted occasionally & a search of

very thin, very irregular, common
 thin, all of the kind of things in
 certainly, corals, and it is common
 much of it is yellow - it is then
 divided into the 'interior' part of
 course, dark, yellow, & possessed by
 solution, but some, without faces
 also, in particular situations - the parts
 on almost horizontal, or nearly
 vertical, but then, around, then
 as the ground appeared to have been
 to have been, - there is the bedding
 of corals, & parts of it is visible
 of growth, & much of it is preserved
 found in the interior, it is a
 hard part, but seen, and in the
 would split, & would give rise to
 the interior, & would be considered
 along the junction, but it is sharp
 on the interior, or on the exterior,
 layers, & is common.

1.51 To the station of the road

corals preserved - replaced by
 outline of growth, still preserved
 by 165' - would be to ground
 all the way up - sometimes in
 abundance, & - large, rounded
 shells, etc. - are found & apparently

1.52 → from ¹⁵⁵ 165' level, out the type of
 preservation - some replaced & some
 have remaining, but are completely
 and so, for, some, which is the
 preserving coral sections, which will
 be the block when all is apparently
 hardest secondary stuff.

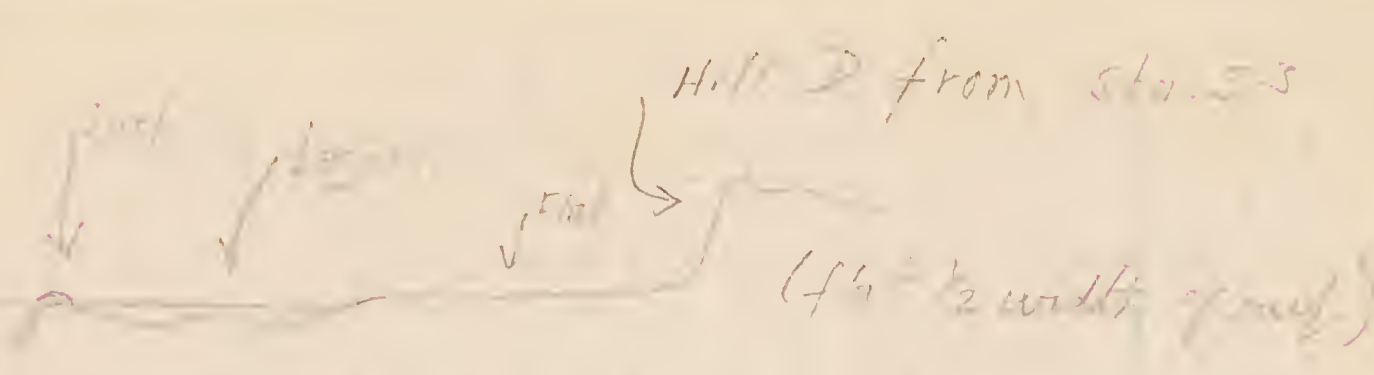
1.53 Top of ridge on " " (low way)
 - elev ²⁰⁰ 245' (North on side of
 way - ... elev. 220' - would be probably
 a few feet higher. Ridge most sharp
 with two, and 1/2 to 1 mile along, top,
 & present of them, not here, where
 T.M. Point, on ... in 225 H
 (the 225' ...)

Reef 54 ... from ...
 your ... of the ...
 can't ... of patches ...
 ...
 ...
 ...
 ...
 ...
 ...
 ...

(F4) #1 View of ... looking W from ...

... found ...
 ...
 ...
 ...
 ...
 ...
 ...
 ...

Upper ... of ... face ...



Here ... E side of hill I ...
 not appear as sharp as Sta. 53.

... for more ... in
 the ... about ...
 than ... plan ...

Reef ... not ... as seen from
 here - ...
 Reef ... fairly ... the inner
 margin ... by
 ...
 Reef ... to the ...
 ...

Descent to sea - ...
 continuous for ...
 for ...
 ...
 ...

154 much altered ...
 little ... showed coral

structure. *Pecten*, gash shell,

L55 at ~~120~~¹¹⁰ level. ls. brownish with corals, gash & pelecys. Contains much white banded mat. - most of which appear to be secondary. This a locality with a 'pseudo-bedding' - a peculiarity referred to. I suspect that many corals have been more or less completely removed by sea.

L56 - ~~140~~¹⁰⁰ level. Found no corals here after fairly good search. Much banded sec. material & some of white ls. look like good detrital stuff (make thin section).

L57 - ~~120~~⁸⁰ level. Look like foram & detrital ls. - no corals seen after brief search. (algal nod.)

L58 - ~~90~~⁵⁰ level - foram? & detrital ls.
- hard, punky - like corals ls?

~~75~~³⁵ level - like ls. - no corals seen - not sampled.

(F42) #2 - Black edition of Harpo Marx (1)
Anemoid checked in at 50' shortly after finishing above section - make correction - (correction made)

Put out in reef origin discussion that the unusual presence of evidence of the recent 6-foot shift ^{in Fiji} shows that noticeably submergence has not gone on here since that shift (close of Pleistocene?)

Thurs. Mar. 8th

* Anemoid, home Monothalam 29.815 at 6²⁵ AM
(Rain - no field work)

Fri. Mar. 9th

* Anemoid, home Monothalam 29.82 at 7⁰⁰

Very difficult to negotiate passages in canoe against incoming tide. A low wall of water - boils through passages. Succeeded at last in getting through second one. Tried

(L35) Collected additional fossils from lower 10' between hill A + end of SE horn.

Climbed hill A_n - elev. 60' - stands
(or one very close to it)
at junction between beach & rocky

L59 corals. Rock at top white, porous & irregular.
Corals ^{fairly} numerous & evidently there is lot of
elev. reef here. Corals much better preserved
at lower levels (where reef structure can
be made out). Top very rough & covered in
beaked - considerable lim. secondary material
Some fresh in dull, cherty & brown - this
mostly replacement material?

Level 35' is certainly good elev
ref on sea cliff show numerous flat
ref corals in position of growth. When
will expand the rock make up most
of rock. (Level 15' \pm in back covered)

Beach rock in 10' beds here
dipping 7° to seaward - a hard grey
weathering ss.

Section of Hill B (Dakelona)
at point ^{1/2} mi. NW of highest point.
Crest where climbed 155' & is perhaps 15'
lower than point ^{1/2} mi. to SW.
Ls at top on vertical a

mass of sharp craps. Corals? small.
L60 bryozoa & forams - molds all

Climbed hill B_n (opposite Mavaloke
beach) - summit ^{all point 1/2 mi. NW of highest point}
¹⁹⁰ 185' stands
concentrated SW part of bay enclosed
by low firm stone to SE horn. Corals
in this area very irregular. Shore
mostly rocky but with narrow
beaches here & there. A summit to
NE is 15' \pm higher. Doubt if
any hills near here reach 200'

L61 Sample from summit - 190'

L62 - ¹⁵⁵ 150' level - just below zone
of recent pitting

L63 - ¹²⁵ 120' level

L64 - ⁷⁵⁻⁹⁰ 70-85 - good coral reef - heads
very numerous & in position
of growth - Recognizable as
such in spite of lead
pitting. Corals very numerous
in float - sample from low
10-15' cliff - here in

split of abundance of rock
 I believe many colors have
 been completely or almost
 completely removed - few of
 outcrop with abundant
 elongate (hor.) pits - giving up
 the appearance of irregular
 beddedness (around checked in in the low
 - 5' excavation made - shown)

1-2 ft deep - 2000 ft or more
 for many miles - for
 instance of fossils etc. - and
 weathering away almost
 to the point some fine
 with 2' beds - with fossils
 or (possibly) alone

L65 Near hill B. (thence where
 L66 was collected) - took at
 elev. of 100' (good part - midland)
 some up an all about 15 above
 sea level in SE from island Manitou?

The gap between Manitou and
 the sea is not an open one as
 shown on the map. There are a
 number of small islets separated by
 narrow passages. The incoming tide
 runs through these openings with great
 force, & has a bump of water
 standing up at each - with the rapid
 like ripple of water on ^{each} side.

Sat. Mar 1st

* Arrived Home Manitou 3 P.M. at 5¹⁵ P.M.

✓ Trip to Manitou - 5 to 6 at 6 P.M.

Half of Manitou
 very abundant fossils
 many small
 some large
 some medium
 some small
 some large
 some medium
 some small

bed = 10' over top edge
 also sand just below it
 many rocky fragments with them
 in surface - not too much
 bed quite clean in some spots
 sandy layers - rocky fragments scattered
 horizontally - not many fossils
 some 300' over edge of ledge
 - some in hole about 10' low
 with layers below it in gallery
 - surface now low 300' tall
 back of ledge, some small - fine
 - some fossils - quite 2' below
 surface - strong bottom

F43
 F44
 F47

632 432 441 - view of hill today
 466 G.O. of edge - 100' from bottom
 measured 10' in hole
 P.L. made the vertical line
 with compass development of
 ledge ^{algae} the form with the cement
 coral-like appearance below

Porelithon

area - 2 - 73 00 - surface
 with gentle inward slope that
 is suitable for study. The jagged
 surface may margin here. Inward
 slope of few degrees - cut by
 numerous channels - into which
 water has - surface pink -
 brown with algae in some spots
 of green. The bottom is near
 to low edge at least 2-3' high
 is about 10' - 12' across
 quite a lot of rock in the
 - some are in the
 sand with some blue top
 part large, more irregular
 surface, more surface at bottom
 to the top is up to 6'
 across - height of 1' - 2'
 that is of edge - some
 slope suitable for 2' or more
 low for 20' deep. There are
 some big fossils in the side

on sand at base of hill
 and *Stropharia* fungus. Got
 results in soil core in the
 water permeation. At the surface
 more of slope to west.
 low column were noted, that
 was more lower than first
 - about 100 lbs. of algae from
 surface slurry.

4.67. Sample rock by perforance

✓ - trace - got for 1/2 way down
 x note 2.8 ft. to 7.5 ft. - a
 few more columns with the
 20, tracing down into below
 edge of perforance

One slurry got from below
 10' and average in perforance
 of an ore 100 yds. long of ore
 30' wide - channel to surface
 - down edge 2' by edge
 then goes to side of small
 pits - the more lagoon

mostly made many columns
 mineral in large (cubic) patches
 on horizontal edge of perforance
 but some at base of ore here
 with some scale of surface

Many holes in small
 sandstone by the part of perforance
 - small patch of mineral in
 slurry hole is the in
 large pits - to sandstone
 got ore - that is a name
 in hole - sample ore upper
 & highest part of March 1st
 day - only one other
 change of mineral in

4.66

got piece of mineral in
 hole in sandstone

sandstone is E
 - a bit of gal zone in sandstone
 4.66, very sandy stone 1 - 2' on
 (horizontal) part of surface

The

... ..

50' ±

30'

Lau

1984

Feb. 1984

XIII

LaBB

261

... ..

50'

...

...

...

75'

Below a 366'

Then Engene - low

261

Ladd

XIII

1934

Feb-Mar

Lau

P.V. #6 - View of hill behind Monothaki

Note that no good bedding was seen on Kulanga - even on bay islands where lagoon dep. should be preserved.

Important facts to be stressed in Kulanga paper -

- 1) 260' of ls. are present & the rock is almost invariably coralliferous at all levels.
- 2) Coral reef rock (i.e. true elevated coral reef) is well developed in most of seaward cliffs (both outside & in lagoon) at level near S.L. & (in one place) at level 65-75 feet above S.L. Corals that appear to be in original position of growth were found at top of highest hill.
- 3) In many places forams & detrital stuff appear to be abundant but a fair amount of such rock is to be expected in any reef near surface.

4) No good bedding was found anywhere on Kulanga

5) Kulanga & glacial-control theory: - Here are difficulties. We must first determine the age of the ls. & from that the probable time of uplift - bearing in mind the time necessary for the solution that has taken place since uplift. Kulanga 100f. low sea further from the land to seaward than to seaward (or with a no. of tide) but a careful chart study will have to be made before this can be said to have significance. It can hardly be Pleistocene if corals were pulled off then. If Tertiary was Kulanga plain? If uplift? If post-Pleistocene a lot has happened in recent time - growth, uplift, erosion, etc.

we put it in the traps ...
 about 6 o'clock ...
 a shell ...
 in mind ...
 in mind ...
 especially ...
 for long ...
 actual ...
 has been ...
 being ...
 the ...
 without ...
 because ...
 or about ...

From ...
 808 ...
 back ...
 now ...

N 80 W ...
 D.S. NOT ...
 along ...
 (to ... East)

(F14) ...
 H 1 ...
 H 2 ...

(F15) ...
 H 3 ...

...
 469 ...
 ...
 ...
 ...
 ...

... ..
... ..
... ..
... ..
... ..

(F16) - II, #4 Looking S20W from near top
of Con. - Beyond left with Murchison
- low part of Murchison's side top of
of lower on right

L70 - 20' level - some fossils much
... ..

L71 - 230' level - some fossils
present. Rock not deeply pitted
but nothing can be distinguished on
surface

L72 - 240' level - some fossils
... ..

L73 - 190' level - 180' level - some
... ..
... ..
... ..
... ..
... ..

L74 - 155' level - corals & mollusks
- rare - rock dense - no typical
... ..

L75 - 130' level - some detrital? le
... ..

L76 - 90' level - detrital? fossils?
... ..
... ..

L77 - 35' level - dense - white hard
... ..

L78 - 10' level - some fossils
... ..
... ..

L79 -
... ..
... ..
... ..
... ..
... ..
... ..

side in good - large heads
in situ - should collect here.

Tues Mar 13th

* Aneroid, house Monothake 29.81 at 6³⁰ AM

(Fix) Moll D. # 5 Naha & girl - Monothake

N.G. III # 6 putting in Rec. rip at stone
wide open @ 8-9³⁰ AM - clear

Can when U.S. no 15 taken here
235 p NW of pt on Mon. - stone trail
just E of where it leaves coast.

Bottom samples ~ Inner lagoon
(see map)

L80 → Off pt S of Yana Yankalon at 4¹/₂ f.
- sand - no living coral

L81 → 1/2 way point to Yana Yankalon

L82 @ 5²/₃ f. - gray sand - no living coral
→ 1/2 way Yana Yankalon to Taluma
- see maps - @ 7 f.
(and see next page)

Took bottom ^{water} sample in
Mainerch can - 5¹/₂ f.

Wed. Mch. 14th

Heavy rain almost continuous

- move to rear for engine. Did upper work.

Thurs Mch. 15th

Rain & easterly wind make
passage impossible - trip postponed

L83 Sand & shells - 4 f. - no coral
rept'd by divers

L84 Sand & dead coral - 3 f. - some large
heads said to be living - 1 dead
but fresh colony 8" brought up -
a branching form - loose on
bottom - see sample.

L85 Sand & live coral - 5 f. - sand covers
more than 50% of bottom - colony
sampled over 1' long branching.

L86 E side Qulagda - algae? - coral
in place - considerable debris -
- moll. rare - good reef to on whole

Fri. Mch. 16th

(Trip to Angai - no field work)

~~10~~ ~~11~~ ~~12~~

Ongea

Set. Mch. 17th

* Aneroid, house Ongea 29.765 at 6²⁰/_{AM}
(low tide at 4⁰⁰/_{PM} ±). Rain most of day.

Possible interpretation of Ongea:—

1) An elev. atoll like Fulaigan - in which case it shows:

- a) a very elongated form in N-S direction
 - b) highest rim to windward
 - c) widest flat to windward (but very little wider than elsewhere)
 - 2) lowest part in south-central
- an elev. ls. covered bank - present contour very due largely to atmospheric + marine erosion - former responsible for dismemberment, latter for lagoon flats (with aid of submergence).

-note that both lagoon passages are toward

L87 Ls. at village 0-6' above high tide.

Outcrop badly pitted, dark gray on weathered surface. Fractured surface

white, porous, sugary; in places densely by secondary ls.; sec. calcite also present.

In Rec. mix rock is less deeply pitted + more resistant brown ferruginous

deposits stand out prominently in relief. Corals + coral borers present but rare + other mollusks besides the borer also occur (bore with orig. shell?). Ls. apparently identical lithologically with the more altered outcrop of Fulaigan's lag-of-islands outcrop. No detrital or foram. stuff seen.

The sea is rapidly undercutting the rocky toadstools that occur on the low-tide sand flat. The sand is probably just a thin coating as for some yards beyond the overhanging edge of the toad-stool islets bare ls. is exposed - with occasional resistant projection of lim. clipp. Atmospheric solution very effective to sea level but sea is planing agent - later covering the flat with sand (+ gradually dissolving rock below sea level?) Little hope of obtaining good fossils here - must see Ongea Institute to

Fulanga	10	-	7 1/2 f.	(see map - other cond. as #3) (time 2:30 PM)
"	11	29.6	Sur.	(" " - " " " ") (" ")
"	12	23.7	Sur.	Cave west of Navindamu 1/8 mi ± at 7:30 AM. Sea rises and falls in cave. Pool 20' across and 4' deep; from this a passage leads downward from one side. No rain several days. Tide nearly full.
"	13	27.3 (sur.)	2 f.	Outer lagoon off rocky coast over 1/2 mi. E of Monothak; (see map). Tide almost high (1:15 PM) - some bottom sediment in sample? Have been light showers today partly cloudy all day. Mch. 10
"	14	28.1	sur.	Cave 1400 p. NNW of Munerah (collapsed cave - see p. 64 - called Nakavutu) Water 5 1/2 f. deep and shifts with tide. Tide about 1/3 out (4:00 PM ±) Light showers today (Mch. 10)
"	15	25.0	Sur.	Cave off-track - Monothaki to "store" - (see map) - pool 5 x 6' in which sea rises and falls - very shallow (1-2') - no rain several days (Mch. 13) - tide 2/3 out (9:00 AM) (checked in later) - aneroid shows water in cave 6' above S.L. - but barometer is rising (see p. 90)
"	16	(see #14 for sur.)	5 1/2 f.	cave - same as #14 tide high - 5:00 PM - heavy showers today.
Ongea Levu	17	25.2	sur.	Cave 300 yd. ± N of edge of Ongea village. Pool very irregular - 20 x 40 ± - sur. of sea level - tide rises & falls - pool much smaller at ebb - no high tide today Showers part few days - this AM (10:30) Mch. 20
"	18	(see 17 for sur.)	2 1/2 f.	(same as #12) Mch. 20

20	25.0			
"	20	25.5	"	<p>Exam on subjects of the coast (S. 1/2) water 10' deep - sandy - point 1/2 mile - subvertical - 1/2' deep - 10' point that was to some - 1/2' that high 1' - 10' in - subvertical - 1/2' 1/2'</p>
"	21	31.7	"	<p>East coast of lower bay - point due S in Dares where - 1/2 mile from S</p>
				<p>was only 1/2 mile long rocky flat. Tide about 1/2 coming over rocky flat from said flat. No rain yesterday said to be 220 early this AM. - taken at 11:30 - sunny Veloc - 1/2 mile from shore and 1/2 mile along the shore - sample from lower bay</p>
	22	34.0	lf	<p>Water beyond about 2000 ft. (S. 1/2) - tide 1/2 part flood - 1/2 part rain 2 days - partly cloudy - Mch. 24</p>
"	23	27.5	wf	(Same as # 22)
"	24	27.7	df	<p>Water beyond - low water 6 - 220 all at 2000 ft - 1/2 part share to 2000 Mch 25 at 11:30 - cloudy tide rising - 1/3 in S. 1/2 tide 2 1/2 days</p>
"	25	27.1	lf	<p>Water beyond 5800 beyond 1/2 mile from S. 1/2 of W. bay 220 - 1/2 part Mch 26 - tide 1/2 part 1/2 part rain</p>
"	26	27.8	lf	<p>Water beyond 5800 beyond 1/2 mile from S. 1/2 of W. bay 220 - 1/2 part Mch 26 - tide 1/2 part 1/2 part rain</p>
"	27	27.8	lf	<p>Water beyond 5800 beyond 1/2 mile from S. 1/2 of W. bay 220 - 1/2 part Mch 26 - tide 1/2 part 1/2 part rain</p>
"	28	27.8	lf	<p>Water beyond 5800 beyond 1/2 mile from S. 1/2 of W. bay 220 - 1/2 part Mch 26 - tide 1/2 part 1/2 part rain</p>
"	29	27.8	lf	<p>Water beyond 5800 beyond 1/2 mile from S. 1/2 of W. bay 220 - 1/2 part Mch 26 - tide 1/2 part 1/2 part rain</p>
"	30	27.8	lf	<p>Water beyond 5800 beyond 1/2 mile from S. 1/2 of W. bay 220 - 1/2 part Mch 26 - tide 1/2 part 1/2 part rain</p>
"	31	27.8	lf	<p>Water beyond 5800 beyond 1/2 mile from S. 1/2 of W. bay 220 - 1/2 part Mch 26 - tide 1/2 part 1/2 part rain</p>

				<p>one bar to sea side 1000 - 1000 1000 - 1000 1000 - 1000</p>
May 15	30	27.5 (at low)	15.5	<p>low tide - at sea side one bar to sea side one bar to sea side one bar to sea side one bar to sea side</p>
May 16	31	27.5 (at low)	9.5	<p>1/2 S.E. of 30. 10% almost half way to reef. Apr 5 at 12:30. Tide rising within 1 1/2 hrs of flood. Spring tide at 3:30</p>
May 17	32	27.7 (at low)	3f	<p>N. coast (see map). May 8th at 3:30. Partly cloudy; no rain except at night. In bay in I.S. coast.</p>
"	"	"	3f	<p>low tide. May 15 by EH - some rain in early AM. sea was low - 1/2 of a month</p>
"	34	27.7 (at low)	2f	<p>same as last - good low at midnight</p>
"	35	27.7	Sur	<p>Not any low - at midnight (see # 36 below) SL</p>
"	36	27.7	10	<p>Normal Low - May 17 4:00 PM - tide lowest at 4:00 - Rain almost continuous last 1/2 days - cloudy - at sea side</p>
"	37	27.7 (at low)	6.5f	<p>Same as last - many will organize settlement</p>

Clear & sunny at 10:00 at 6.5

1.85 sample of sandy soil at low tide
 sand at low tide level

1.87 lower cream colored fine-grained
 sand from beach - a few
 coarse grains. Partly broken
 fragments of shells.

1.88 sample of sandy soil at low tide
 + salt & some shells (1/2 of a month)
 a red flat - very smooth - 1/2 inch
 thick - in water - 1/2 inch
 thick & 1/2 inch high -
 pattern with vertical lines - very
 greenish - smooth - very fine
 1.90 { fine flat white - the fine soil
 filter through with 1/2 inch
 one chain - a few shells
 just a few shells - 1/2 inch
 of material

1.91 sample of sandy soil at low tide
 No more shells

about N25E - in channel close to shore (as in Fulanga).

84

It is very interesting to note that at precisely the point where the fringing reef begins corals become very abundant in the elevated ls. (noted obliquation of reef structure for side N) This is probably not a mere coincidence - due either to ecological situation - wind & current direction, etc? The pitting in the elev. ls. (in zone at least 10' above top of reef) differs markedly from that observed to the N. Here the pits tend to elongate sub-horizontally & they imbricate & overlap - rarely dipping at steep S. When the undersea are examined one can frequently see the molds of flat-growing reef corals. When a block has recently broken away being coral (apparently all one colony) is exposed over area

2 x 7 ft (see sample - this is apparently commonest species). Molds of gorgonids rare. At the foot of the elev. ls. reef the waves have partially filled the reef with small to medium sized coral heads (larger one averaging 8") & numerous *Tudacna* shells. These ^{corals} are of all shapes & are jumbled together - they exhibit not the slightest tendency to such a regular arrangement as that seen in the elev. ls. - rarely as a head in the cliff face distinctly out of growth position. Seem to be in fair quantity of corals on cliff. But the reef structure is about as good as anything I saw in Fulanga. Reef fringed by low ls. platform (except for bank of coral heads). Some of the dead corals on the surface appear to be recent.

L94

South coast O. Ndrite - 0-15' above

85

nip - Good 15' of reef above
 nip here - probably much more
 but at zone 10-15' above nip
 the cliff usually slants a lot
 less - for that or for some other
 reason the effect of atmospheric
 corrosion seem to obliterate the reef
 structure - level at which this begins
 is variable.

A few small colonies were
 seen which obviously were not in
 original position of growth - but these
 are rare.

At one point trace of 6' shaft
 clearly seen

It seems likely to me that S. cliffs
 of O. Nante are now or less pt. of old atoll
 rim - I doubt if much of it has
 been eroded even here to windward

Went along nearly to east end
 of S. coast - at least one low
 saddle on rd. bluffs elsewhere

sign of presence of interior

- L95 Western end of fringing reef, much
 like that of Monothalpi but
 cup-like edge surface is nearly
 even - pink "corals" on seaward
 sloping marginal zone. This
 zone here roughened by humps of
 these pink pipe algae - corals few
 + small. Turbidity surf today
 + I cannot go far out. Immediately
 inside marginal zone surface is
 L96 hammocky - no living corals, deep
 echinoid borings locally abundant
 - some fine + coarse debris but
 no sign heads. (To W the inner
 margin of the barrier - facing the
 lagoon - is toward)

Apparently I walked about $\frac{2}{3}$
 of south coast this A.M. Bay begins
 at end of my traverse + other head
 can be seen beyond - High

point on S coast is inland from big beach near W end. Most of reef along S coast probably does not dry at low tide.

Megro heads scattered over a zone that lies just landward of L96 - inside that is green water except when "algal barrier" touches shore.

Falls over algal barrier up to 3' into lagoon on W. Terracing + foot-outlining (capped with barnacles) well shown except near seaward edge.

L97 Algal barrier - to seaward of mid-point (Reef front continues with some transverse channels). I guess the reef has algal ridge, though it is not much elevated.

Living corals more numerous

in megrohead zone to E of algal barrier but at best they cover only about half the surface & much of the coral is dead. Megro head belt about 50-50 coral patches (dead + alive) + shallow pools lay to 2' ^{deep} at low tide. Some coarse calc. sand on pools.

some deep algal channels on S coast

- Algal barrier (transverse) only partly algal. Edge ragged - not high. Into it capped by barnacles - also on all low pts. landward pt. - barnacles on high pts. only.

L98 Rounded nodules - Very abundant in zone just E of seaward part of algal barrier.

Tues. Nov 20th

(Broken sail prevented our return to Ongea Linn last night - slept in leaf shelter on beach.)

L99 Lvs, saucaroidal, hard, porous - few feet above high tide - middle pt. of

The first of these islands is the
 largest, and is the most fertile
 and the most populous. It is
 the seat of government, and
 the residence of the king. The
 other islands are smaller, and
 are inhabited by the same
 people. They are all fertile
 and produce a great variety
 of food. The people are
 friendly and hospitable, and
 are very fond of their
 islands.

The second of these islands is
 the most fertile, and is the
 most populous. It is the seat
 of government, and the
 residence of the king. The
 other islands are smaller, and
 are inhabited by the same
 people. They are all fertile
 and produce a great variety
 of food. The people are
 friendly and hospitable, and
 are very fond of their
 islands.

The third of these islands is
 the most fertile, and is the
 most populous. It is the seat
 of government, and the
 residence of the king. The
 other islands are smaller, and
 are inhabited by the same
 people. They are all fertile
 and produce a great variety
 of food. The people are
 friendly and hospitable, and
 are very fond of their
 islands.

The fourth of these islands is
 the most fertile, and is the
 most populous. It is the seat
 of government, and the
 residence of the king. The
 other islands are smaller, and
 are inhabited by the same
 people. They are all fertile
 and produce a great variety
 of food. The people are
 friendly and hospitable, and
 are very fond of their
 islands.

The fifth of these islands is
 the most fertile, and is the
 most populous. It is the seat
 of government, and the
 residence of the king. The
 other islands are smaller, and
 are inhabited by the same
 people. They are all fertile
 and produce a great variety
 of food. The people are
 friendly and hospitable, and
 are very fond of their
 islands.

...
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L192 - ... E ... 101 ...
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L193 - ... SSE ... 40 ...
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...
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L194 ₁₆ ...
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larger
 forams?
 - send to
 cole

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 ...

are so heavy - so frequent may they not delute the lagoon surface sufficiently to smother some to prevent some solution at lagoon surface? Putting in mud looks as if must be at an abrasion.

(L104) Sample of coarse grades of calc. debris from 104 elev. and with alveol coll.

L105 is - 200 p. from 104 Elev. 50' - much sec. mat. (both white & red) - have suggestion of reef structure - no corals seen - flattened out of 50' level

up to 100' at 500 p

L106 is top part at ~~110'~~^{110'} at 550 p. - over 15' in exp. in bluff on N. side. Lined - suggestion reef structure + some corals - apparently in position but are too few to be sure. - Corals remaining reveal numerous corals - though putting in bed. This probably elev. reef. Corals from ~~115'~~^{115'} level. ±

12 - down to 60' level at 654 p. and trending little N of W. (N80W)

11 - turn S at 850 p. - swinging

10 - heading 565 W @ 1100 p - elev 60'

L1079 - p. 1350, elev. ~~75'~~^{70'} - practically structureless white ls. - so badly leached on the flat ground that I believe little but sec. ls. is left - more trending SW.

(8) - 60' at 1600 p - S70W - flat

(7) - 77' " 1868 p - turn S - "

(6) - 62' " 2200 p - S60W - disordered flat

(5) - 57' " 2316 p - turn S. - pale white

(4) - 42' " 2630 p - low spot - W corals

(3) - 58' " 2725 p - high

(2) - 28' " 3038 p - part of reef

(1) - 15' " 4150 p - near lagoon

↑
Make a section for Sta 101

(cont. p. 91)

to sea level - but part emerged & is subject to atmospheric action of weather for shorter time. 20

if for essentially same time
at least its situation is better
- an outcrop on a hill top will
be leached for more quickly
than one close to sea level &
aster fact - by the time they
reach S.L. the water may be
nearly or quite charged with CaCO_3

Probably one of the most important
results of the Fialanga-Ongia work
will have to do with the structure
of elevated reef rock and the
alteration to which it is subjected
by atmospheric agencies (bearing
in mind the possibility of some
alteration in composition &
structure prior to uplift
(see Skeels). In Davis points
out (p. 383) the structure of
elevated reef "has seldom been
made out" (review Andrew

matter - as I recall it he
says little).

Field observations should be
supplemented by a study of numerous
thin sections (see Pagan for acid
and recrystallization) & possibly by
chemical analysis of "algal" ls. (algal
structure to UAS & that with forams
& Klump).

Is it possible that the reef
ls. is younger than the rest of
Fialanga & Ongia? Can it be
a sort of vertical veneer? I
doubt it - between the widely
distributed "quartz reef" structure
(vertical reef) & occurrence inland
of reef reef at one point &
independent occurrence of same
corals in flat ls. at high
elevation, but occurrence
of corals apparently in position

at the same time
of great extent of the
there seems to be no
evidence of any terracing
on the mountain side or
on the plateau - on the
I have seen - the two
to appear to be in fact
in the same line to the
& altitude of the
weathering must be
responsible for its
condition.

Study pointed to the
shape of the mountain
altitude - especially it looks
much like Oniz's form to suggest
that it has been

Part - The mountain is
geological in fact in some
low level - it is supposed that
the geological of the mountain is also

TO DUPLICATE THIS ORDER

REFER TO

JOB No.

51709



