UNITED STATES
DEPARTMENT OF THE INTERIOR

DI-6

APPROVED DECEMBER 1941

Book

2.

Cuttings -

0 - 970

1040 - 1060

1075 - 1200

1375 - 1918 - mist from volcano?

2000 - 2130

Core

9 - p. 49, 5

10 - p. 5a, 6

11 - p. 8, 8a

12 - p. 12a, 13

13 - p. 14a, 15

14 - p. 16a, 17

15 - p. 20, 20a

Blank

Fl. Executive Suite

(cont. from 11-5-11 Daily Report)

5.2 [illegible] = 2 [illegible]
[illegible] [illegible]
[illegible]

7.05 [illegible] [illegible]
[illegible] (5 min sample)

7:05 - 7:10 AM 3551 - 3560

6/1/12 - Survey - 6 AM - 7 PM Rocky

3560 - 3562 - 2' in 1 hr 10 min

Shut down to work on pumps, etc. and refill pits; start to resume drilling at 11 AM - cuttings packed 11 - pulled up, bit plugged, dropped short length pipe, made drill pipe and out of hole, lower part string plugged with bit cuttings (result collapsed pipe)

Mud motor packed, freed free, pulled out the reamer bit, put motor back in hole and pumped clear.

Pick up [illegible] back to work

[Note on cuttings from plugged drill collars 3562 ± higher - mostly c 100' higher acc driller.

Many forams, mostly small but some larger, gast. epoky forms, molds, small brachiopods with brachia, frag corals etc; preservation not good - forams with bits calcite cemented to shells, margins incomplete, etc.]

4:05 PM Core Barrel to Bottom Ready to Begin Drilling ——→ Circulate to Repair Equipment (Winch)

5:10 Begin Drilling at 3565'
6:07 Reached 3650; still very soft drilling.
6:20 Started pulling pipe.
8:35 Pipe out. Core barrel put on.
10:55 Core barrel at bottom of hole. Core taken in about 5 min. Core barrel stuck at bottom. Drillers could not get pipe. Evidently sticking was caused only by core in barrel and pipe was dropped to free core.
11:10 Freed drill collars and started to pull pipe. Pulling pipe wet most of trip. Down to 3655'.

June 2, 1952 - Midnight - 8 AM Russell

1.30. Pulling core out of hole. Joints very difficult to break - double tiring cable always.
2.30 AM and a Tong-jaw pair - and a winch rope and a second tong cable

4.00 AM - Core barrel up - No core recovery - Barrel jammed with sand - Wants to get pushed back to bottom, core - then take another circulation.

Bailed Experience on 4" pipe in the hole
after circulating on to collect
sample of the mudcake to
clean out to bottom on hole
with tools and rock bit
Left re-adding a core barrel on
outside. The core barrel consisted
of two right back on with
a pin of mud for cleaning bit
and cutting. It was finally
decided that the core barrel was
to go back in and keep the
mud would clean and ahead of
barrel sufficiently to take care.
(An alternative to core barrel was
suggested by Jim Pike if thought
that more of the soft formation
could be recovered by leaving a
special diamond circulation ground
head. The disadvantage of the
core that no more than 1 foot
recovery in Bozeks and with
any kind of luck more than that
could be retrieved with the core
barrel).

4.45. Starting mud for core run.

To end of shift.

June 2 - 1700 - 8AM - 4PM - Cold

9.00 AM± into hole with heavy mud & bit
11.00 ± at coring (with circulation) at 3650'
after circulating out 90' cuttings.

Note on Core #9 - 3655 - 3665'

Small unoriented pieces of tephra core appear to be mainly coral.

Fresh oriented section is a section of white, friable limestone. Two pieces from bottom of this sent to Cole as sample Q. Second oriented piece is 6" long.

Dissem[illegible] of forams and corals much like that recovered from plugged drill collars (3362' & higher). Forams most are present with orig. shell but rock is mostly as foraminiferal ls

Remainder of core consists of smaller pieces none of which are oriented. Part of mid. and lr. core consists of white coralline algal ls.

Lr. large k fm has orig shell some fm and molds are encrusted with banded ls that may be algal.

4 c

that may be algal

4c

[illegible]

2:20 PM out of hole with core barrel
3665 - 3665, recovering 3'3" (=33%)
of hard but friable, white, coral and
shell limestone (core broken up in several
pieces when placed on paper)

Reaming

6:30 FINAL RUN ON REAMING DOWN TO
3665'

6:37 DOWN TO 3665' - REAMED WITH
CUTTER ON BARREL - MADE NO PROG-
[illegible]

[illegible]

Same 3 - Twin Mud = 8 P.M.

TOTCO survey shows hole
off 1° at 3263

(5)

Notes on Core #10 ~ 3163 - 3956.

a white ——— friable [illegible]
1/2 - numerous smaller forams and much fine detrital material. [illegible]
but no larger forams); also rod-like bodies of algal (?) origin; [illegible] mostly as molds
(on Pectin fragments); possible-litter lumps
app. structureless to 2-3 thin sections; rock splits
(sample from near top sent to Core
-Spl. R)

5a

Calc Sample
#10

Core
3963'
3980'

7.10. AM.
Core pulled - Bit recovered
of 25' Drilled - 12' recovered.
[illegible] 5 pieces, oriented.

6/3/82 8 AM - [illegible] Tues Lunch - Explorer
Back into hole with 8¾ rock bit

ONR
Rpt #6 ⇒

10:23 AM BEGINNING TO DRILL AT 3980' [illegible]
[illegible] DRILLED ONLY
[illegible] FOUND TO
[illegible]

[illegible] CREW ARRIVED AT SITE ——
EXPLORER 1615 - 4621 DRILLER
[illegible] AT 8¾ SHORT IN HARD
[illegible]
[illegible]
[illegible]
1615 - 4646 - [illegible]
[illegible] DRILLED.

1230 AT 40°F Lemon Oil + Simoni #1 applied

1235 To 40°F, during study, one medium -

12:35 To 4195', drilling slowly, one medium-hard interval 4070-80 - 11 min. (cont.)

1:00 PM 4169

1:30 4137' Gamma high / start drilling very little pressure on bit - No resistant strata in this ft.

2:07 4165'

2:36 4197' Same drilling as previous - stopped to change drill pipe

Set slips and pipe to check for drag - appears to be none. The drilling time might represent thin, soft strata in the sand (3986-4197') shows a slightly longer time per foot drilled in the range from 3 to 6 min. per ft.

When another joint was added at 4165', the pump was shut down but not working it (as it was decided to check for drag) Lost circulation - only 43 bbl returned

Set slips at 4197 showed 3½° deflection.

To Tc 2 check at 4152 showed 4° (?)

(7)

Then pulled to
bit after

55 Circ out from 4197'- 4222'. Approx.
[illegible] in./ft.
[illegible] in./ft.
[illegible] pipe pulled at end of
shift

June 6 Midnight - 8 AM. Pumped
12.0 PPG. Core No 11 - 4197 - 4222 -
Recovered 11 ft 2 inches. 52
44% of 25 ft Core.

Core #11 Core consists of 37 cemented
(see over) pieces and a small proportion
of small, unconsolidated pieces
of sand & gravel. Material is fairly
well cemented, poorly sorted, ranges
in size from pea and smaller fragments
mostly with visible organic (shell-
fish?) debris? All well rounded
and polished in bulk. Rare mollusk

Notes on Core No 11 - 4197-4222'

Friable, crumble, porous, even-grained to consisting mostly of rod-like bodies measuring 1-2 mm. in length (probably algal - like Lithothamnion) and forams (both large and smaller types; smaller forms more abundant) and fine detritus - all loosely cemented into a "firm" (medium hard) rock. No evidence of solution or extensive recrystallization. Differs strikingly from section above in that corals are almost if not completely absent. Echinoderm fragments - spines, etc. present but not abundant. Rods and flattened forams are not oriented with long axis horizontal but, instead, lie at all angles - a mass of interlocked fragments

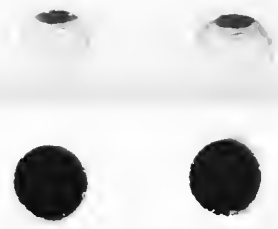
Samples to Cole - 6/7/52

S - from top piece of core

T - " 1/2" below top of core

D - " bottom " "

V - " 2" "



Samples to Col. - 6/4/32

S - Sample from piece of root

T - " 12' Below top of Core

B - " 6' " " " "

V - " 2' " " "

Note on Drilling Interpretation

Because much of the material drilled with the Calyx drill is much crushed, the interpretation of the log is difficult - primarily in loose, unconsolidated sands. Although it can be readily concluded that there are many unconsolidated layers which

Made this method thereby
for calculate deflection of
beams at two different
loads, check the slope
beam fixed to beam with one
end overhang and then
beam fixed to beam with
two overhang ends.

To reflect with
reality we considering the
two relative stiffness. However,
on the basis of thickness
density and life of pencil lead
and the experience we the ground
depth (case I and case II) at same
load, prior to actual recovery
of case II that because the
soil particle in the sand
mostly flat and smooth, when
[illegible] being tap [illegible]
the surface of [illegible] and
the surface moved to neighbor.
The sand reduced normal stress
redistribution factor, recovery very
big [illegible] the sand is "fairly loose".
Then how can find [illegible] Settlement
to understand the behavior
of the last two cases (9 & 10) before
actual recovery. For the load
of case II at last, there are two
possible explanation for this
(or a combination of the two) 1) The
greater length of the drill pipe and
the greater weight exerted there on

Introductory To chapter 2 the subject of [illegible] which can be [illegible] plotted in the upper part of [illegible] [illegible] and [illegible] and [illegible] and

Notes on [illegible] #12 - N316-341'

Top 5" consists of 2 orientated pieces
of highly fossiliferous ls (Sample U ...
Upper ... (Note 2) that ... the
dolomitic ... fairly hard
but broke ... to break up into
entirety of stems (large and small) and
fine detritus

... grades from ... ls dolomite. The dolomite appears
to be ... and courtiers
... -rich bed

... of 2½" thick hard dolomite
The remainder of the border type appears to be ...
... One of ... -thick ...
... ally by ... and ...

... two ... pieces are
white, porous ... Very fine ...
... of ...

Below ... 2" ... sand with smaller fragments
+ minute calcite ... - top ... with shell
... by 3½ ... fossils. Rock
moderately hard but friable and may be dolomitic
... shell cast + broken (one piece with
Pallatispira ... sent for ... sample X)
with hard ... dolomite ... with fossils in
... matrix

... - ... hard
process ... Pallatispira
... fossils

12 y

white, porous and friable but well cemented many fossils, shell only very slightly worn off - with calcite ppt

Below 11-2' white sand with smaller fragments ~ minute calcite xls - mostly unidentifiable with mica

Followed by 2½' rock similar to piece 6 as this is moderately hard but friable and may be dolomitic

Next 3½ feet soft + broken (one piece with Pellatispira (Eocene) sent to Colo as sample X) with hard fragments dolomitic xls with fossils in xl. matrix

Last 6" broken but annealed - similar to hard pieces in interval above; with Pellatispira (12 a) dolomitic, xl, fossils

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June 4 ~ Wed. ~ 8 AM - 4 PM Cold

- 7:15 AM - have circulated on bottom (4316') since 6:45 AM; pull up to service rig and refill pits.

- 8:00 AM coming out of hole to core
- 10:10 AM into hole with 5 stands bbl
- 12:30 PM start coring - 58' foot
- 2 PM coring. Recovered 32 - 22 - 2½ + 3

Recovered 7' of 8" (8") gradual into hard dolomite (58') - with details. (Recovery 32 c/c)

4 PM Report to [illegible]

Starting to write report with data at 4 P.M.

6:50 Rig in hole & started reaming core hole.
7:05 Hole reamed & drilling started. Reached
8:05 4706' at 8:05. Drilling from 4341' to 4406'
Hooked Kelly down after adding.

two joints of pipe. Water then pumped
into hole 7 circulated for 2 hours. When
pipe was put into bottom of hole, 100' of
cuttings had settled.

1010 (Approx.) Started to pull pipe.

Drilling at interval 4396' - 4406' (about
5' more of the very hard zones, but did show
some penetration - from 7 min/ft. to [illegible]
min/ft.

[illegible]

Foram - algal (?) debris.

Note: ~~(cf. F-2)~~ 4 pieces/

White, dolomitic, foraminiferal ls. with many short rod-like bodies that are probably algal, with fine detritus. Larger fossils include type with inflated central area and wide wavy border (note marked specimen in 2nd oriented piece from top)

Molds of gast + coral present in small uncrinoted, denser piece (2nd from bottom).

Bottom piece is 5" crinoid section with numerous forms and molds of coiled and deeply ribbed paleozoans, mold of gast. etc (note marked mold of ribbed ~~bryozoan~~ brachiopod). This part of unit has numerous

Part of top piece sent to Calvin for sample #
(6/5/52)

(6/6/52)

1.20 A.M. Core chicken. One 8-foot
[illegible] and three 1-foot [illegible]
drilled at 1 ft per minute. Rest
drilled at 2 ft per minute.
TOTAL 4406 = 3°

Core #13 7.00 A.M. [illegible]
4406-4431

June 5 ~ Thurs ~ 8:30 - 4:00 ~ Rain
Working on drilling line and brakes
10:45 AM - start into hole with rock bit. Got bit
and [illegible] at 4406 - [illegible]
[illegible] Drilling at 4431 ft.

6:00-10:30 A.M.
Drilling at beginning of month. Drilled
to 4566 on 4-7. Then no report of
work (105 Days Report 423 days Employment).
Started 8 hours work day at about 7:30.
3:15 started 6 gallons. 10 Tee inserted.

[redacted]

[redacted] Drilling ahead of 7" liner and [redacted]
[redacted] Formed [redacted] [redacted] [redacted] [redacted]
[redacted] was found to be in excess of 200 ft.
Hole circulated by driller ordered to POOH
@ 5005'
Topic reading - 3½" indication at
4500'
11:00 Pipe out of hole
11:10 Core bbl put on board & began to
rig pipe to slide.

June 6 - Midnight - 1 PM

12:40 PM Core barrel on bottom.
Circulation established
on drilling mud. Drilling ahead.
Core barrel on bottom
reaching new depth for
accumulated cutting & shatters.

1:15 - Core drilled off 18' recovered
as follows

	4500	— 4505	cut ½	min per ft.
*	4505	— 4507	" 1	" "
	4507	— 4508	" ½	" "
*	4508	— 4513	" 1	" "
	4513	— 4516	" ½	" "
*	4516	— 4521	" 1	" "
	4521	— 4524	" ½	" "
*	4524	— 4525	" 1	" "
	4525	— 4525½	" ½	" "

* Cut bit for core.

Add'l notes on Core #14 4525'-4535'

Large forams from bottom of top piece Core Catcher sample AA - 6/6/52

These forams are scattered through many parts of the core but more in abundance. small oyster (in vial) from 16½ oriented piece from top fragments of Rotos from 16½ to 17½

Sent sample BB from 13 oriented piece from top to core 6/6/52 - has large forams and small globular type.

Both Eocene D - BB has few dictyoplegids - core 6/19/52

16a

Core #14
4525

4.25 AM
Recovered 19 feet core

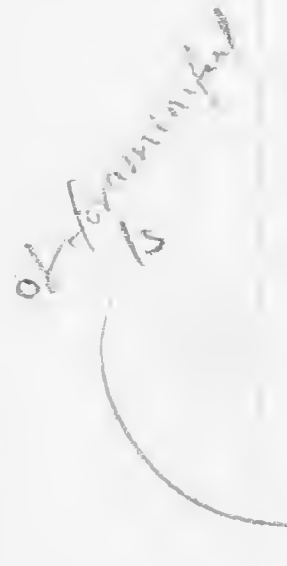
Core #14
4500-4525
(25 feet)

4:25 AM

Recovered 19 pieces of core
core. 5 F.T = 37% recovery
dk gy dol bottom 6 inches
a fine grained dolomite
Lamellibranch. Fair dip visible
a dk gy shale or mud dolomite
in a light, salty, matrix.
Dense chunks of pieces of
creamy white dolomite in dk gy
Fine pieces (not less than 1 inch
diam) of green dolomite with
creamy white (efflorescent
this color) crystals, fragments.
Beds 6" to 1' thick,
total 5 ft.

Four distinct lithologic types
are represented in 5 ft of core.

Probably 7½ feet of a fine
grained dolomite some limy. Mud
dol in varying shades of. Minute
fossils (?) crystals. Many
clear crystal lined vugs with
small crystals (?) Many of all
sizes (?) Many of the
vugs lined. Most of the
vugs lined. Most of the vugs with
some [illegible] of Anhydrite
(?) in small [illegible]
crystals. [illegible]



15

June 6-7 Fri - 8AM - 4PM - Cooled

5:00AM - starting out of hole, leaving rotary @ bottom of last core run - 4525

10:00 - in the hole with 8 core bbl

12:15 - partially plugged in bbl - pull up 3 stands and circulate

12 45 - start out of hole w/ new bit

2 45 - out of hole

[illegible] out in diamond finish of drawing out and
dropping out line with spacing - a fishing job
to do - without proper junk basket —

[illegible] —

Drilled ahead to core barrel. Then
ran in w 6¼" Hughes OSC bit & drilled
5' of hole from 4505' to 4525'. Found
no evidence of core barrel spring & cut
at either end of hole. Pipe pulled [illegible]
(recovered) All pipe out of hole. Decision
made to run in core barrel again and
try to take a core, inasmuch as this [illegible]
seemed to have been [illegible]

[illegible]

[illegible]

Core #5
4525
4553
(28 feet)

5.30 A.M. Bit drilled 15 ft in
25 min. Rate changed from 2½
min per ft to 1½ min to foot.
Recovered 3½ feet = 10%
2 cubical pieces = 3½" and 4".

Additional notes on Pine Co

2528 - 4553'

Only Two of pieces oriented - total length
in Dep = 2' 1"

Top piece a 2" rounded fragment of
dolomite is with numerous foramens - both
large and small in a matrix of dolites
some pieces of which appear well rounded.
This piece is porous but not cavernous
Note one section (a foram?) shows grey
green, smaller foramens and dark sections
& larger type appear still preserved in
host formation dol. to the dark plate

Pieces below are crystalline and show many
more cavernous & pelletal structures, fossil
comparatively poor. Traces of dark stain,
mostly at mouth of cavity (dark mineral
dot - gyp + pelet) - some can probably be identified
as ch. spicules, circle shows (mould-crystal plug)
Subangular coat on smaller pieces; gray
green staining on smaller pieces

20a

June 7 - Sat - 8AM - 4PM - Cook

- going into hole with 8¾ inch bit to 4553 (at 2:45PM start drilling -

- Slow time record - with 5000 lbs on bit making average 5' in 3 min 12:20 PM to 4630' - hardening up a little (2' shale between 4620-30 took 6 min - 4631 4min for 5' interval)

1:10 - distinctly harder (4626-45 in 15 min. and 4645-4648 - 10 min with wt up to 9,000 lbs) - decide to core - circulate until ~~2 PM~~ 1:45 PM

correction in - Dille level overlooked - T.D. = 4619' = 66' below last core

[- Had 120' cavings when rock bit went put to 4553 but drilled had no difficulty getting down + believe we can take core without putting mud in hole]

-3:15 - shut down to repair brakes.

4-11:30 PM

Big start down for repairs.

9:15 Started to pull pipe out of hole.

9:45 Completed pulling pipe. Then we came down to 4619 and started running pipe in hole. Running pipe at 4619 ft.

-at 4619'

6:30 - Still running
Shut down rig - repair
[illegible] - [illegible]
[illegible] - [illegible]
[illegible] - [illegible]

make 5'!) Claims bottom of hole not moving. — [Pyke claims 1' per 1000 pipe stretch] — jam sub is not functioning!

May be extremely cavernous interval immediately above impervious basalt (if no zone of tuffaceous mat. is present). All of our water may be going into this zone and not lifting new (+old) cuttings to higher levels.

Ladd's guess -

Core #15 - 4528 - 4553

Top basalt #610 - or slightly higher

Core #16 - 4619 - 4630 = 11'

4619
4553
66' - lost interval { 57' dol ls?
9' basalt?

Tool joint - 31.61 Tool joint
This unit should be called relatively stiff.
At beginning of shift, still trying to free stuck drill collars with mud motor by

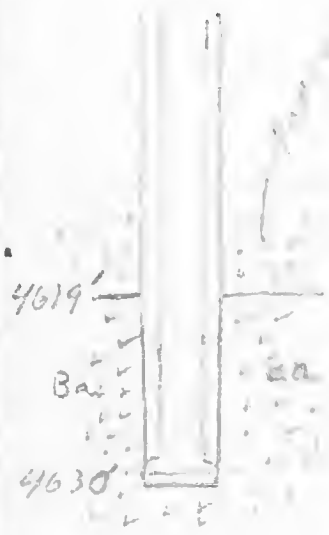
[redacted]

[redacted] tried, Kelly would wind up about
2 turns, motors cough to a stop & Kelly would
unwind. This was all tried after the cracking
loosening pipe connections.

6:30± Started mixing mud with the somewhat
desperate hope that it might loosen & carry out
the cuttings from bottom of hole. To this time
sea water was being pumped successfully into
the hole — in return of water, naturally, but
at least it was going down & away from the
bottom of the hole. It seemed to think the mud
would circulate into the hole with little hope of
enthusiasm except that since by the drilling
it is open, had to start trying & juggling the
pipe which the latter did to a large degree. Opinions
were divided on whether or not the pipe was
jarring. But soon after the mud was pumped
into the hole, it was discovered that although
the mud had failed to loosen the cuttings,
it had managed to seal off the last exit
for any fluid of any kind.... water
could no longer be pumped into the hole!
Drillers like to have circulation, of course,
and they considered the situation at this
point unfortunate & definitely undesirable.

The first thing observed (and perhaps
the only one) the complete loss of circulation
was followed by Dr. Kelly & the pumpers that
the zone directly above the [redacted]-shale
rock (about 4 previously) was [illegible]

113 cu. Zenger
2" Tubing
Air Tanks



[illegible] the cuttings. The hard, [illegible] The [illegible] the mud [illegible] of the pump [illegible] above [illegible] pump [illegible] cuttings [illegible] the shaker. This should indicate a [illegible] gone above 4619'.

[illegible] the time as the mud [illegible] the hole, [illegible] after [illegible] 140,000 lbs. tension [illegible] the pipe, and [illegible] the pipe came free, allowing the derrick to [illegible] [illegible] Load [illegible] to [illegible] working procedure [illegible] semi-circle by [illegible]. The new [illegible] for hitting [illegible] is set. This [illegible] safety was [illegible] by the [illegible] on the derrick to [illegible] lines. The [illegible] supports the Russell theory that when [illegible] lbs. are being pulled on [illegible], the watchers should be at a distance beyond the reach of a falling, 96' derrick.

The last [illegible] incident brought some comment about [illegible] on a drilling job over water.

All [illegible] reported on repair of the cable, after lunch, and with virtually no fanfare, the crew prepared to "shoot the pipe & back away." By the [illegible], a cable was being wound on a drum of the draw works & shot wire & other dynamite equipment was being unpacked.

All [illegible] to [illegible], a hoe-stacking was a

[illegible] out [illegible]. The last
salvage of the [illegible] the [illegible]
that only one cone buoy came with the
rig and that, alas, had [illegible]
directly down — seem to have to this, still
chance of contact existed. Unless the cone
buoy could be recovered by dragging about and
fishing, the saga of [illegible] might be ended
with victory in our grasp, but without ability
to bring it to us.

[illegible]

No.

1129 [illegible] was dis-
covered at the end of the [illegible] that the clutch
on the [illegible] was [illegible] to be out.
Operation either on the coast or malfunction,
but not at the outset. No matter — as far as
the [illegible] is concerned, it's a coals-to-
Newcastle deal.

[illegible]

Ending [illegible]
clutch.

June 9 ~ FAM-WPN Ladd

Rigging sled line for twisting prior to
firing; work at 2500'± ; strip shot placed
126' off bottom - failed to loosen.
prepare to cut second 126' above bottom.

4 P.M. - [illegible]

[illegible] shot [illegible]
[illegible] shots fired as follows:

1) 4415'
2) 4439' misfired
3) 4379'
4) 4069' misfired

[illegible]

11:30 P.M. - 5 A.M. -

Poison sleeping - holes being shot - [illegible] drilling [illegible] as [illegible]

June 10

8 A.M. - 4:30 P.M.

Still shooting!

4 P.M. - 11:30 P.M.

Still shooting!

9:05 P.M. Shot hole at 3450' successfully.

Summary of shots:

1) 4479' - 121' from bottom - fired
2) 4439' - 191' " " - did not fire
3) 4379' - 251' " " - fired
~~4) 4069' - 561' " " - did not fire~~
4) 4070' - 560' " " - fired
5) 3760' - 870' " " - did not fire
6) 3760' - 870' " " - fired
7) 3750' - 880' " " - fired & fired pipe.

Notes on cuttings - (cont)

650 - 710 - Similar to last but very rich in well preserved corals and mollusks and some smaller forams. Moll. fauna mostly gast. (Strombus, Cerithium, Phos, Vermetus, Turbo (operculd, etc.) suggesting intertidal or shallow lagoon conditions; many shells worn - resembling those concentrated in pockets on reef flats by hermit crabs) - pelecy incl Arca, Arcard, Cardium chama, etc

small shale chips from auger to walls.

680 - 690 particularly rich in Strombus - other moll.

Buff, Weakly cemented limestone consisting of well preserved fragments of coral and shells in matrix of fine detritus

690 - 780 Similar to last; large moll less abundant and more fragmentary; some of samples (e.g. 770 - 780 have well-rounded coral pebbles

800 - 810 - similar to last

---

810 - 820 corals and moll. similar to above with pieces of gray marly clay and lignite noticed.

820-830 - like last but carb frag. rare - prob. only contamination

830-840 - coral and shells; coral broken and rounded (up to 1½"); many frag lge pelecy.

- shells (richest sample yet) and small frag coral; many worn broken lenticular forams in smallest fraction

Cuttings

840-850 similar to last with small amt. gray carb. clay

850-860 - coral and shells

From Wells

860 - 870
870 - 880
880 - 890
890 - 900
900 - 910
910 - 920
920 - 930
930 - 940
940 - 950
950 - 960
960 - 970

} No essential change

From Wells

1040-1050 — of white limestone

Fine cuttings consisting of small fragments of coral, Halimeda, thin-shelled pelecy. and micro-gast, Foraminifera numerous & varied.

1050 - 1060 - White coralline fr-ds ls - Fauna of coral + shell fragments quite different from last - many brown fragments in fine fraction prob from above. [This sample and last look suspiciously young - both are small and were collected just after we regained circulation]

1060 - 1080 - no cuttings

1080 - 1090 - white ls - similar to 1050-60+

1090 - 1100 - White coral fragments mixed with sharp fragments cream-colored dense limestone, shell fragments rare, some pieces yellow calcite - still looks much like mat from near top of hole

1100 - 1110 - White - tan - and cream colored ls. Higher percentage of tan & cream colored fragments - Some glauconitic grains, micro nodules. Marginopora. Coiled stream with bony axis (Alveolina?) in vial. Red flecks Homotrema?

Many shiny smooth fragments also many sharp edged ones.

1110 - 1120 - Generally similar to above - Some red fragments are Textularia, Hauerina, Echinid spines, Miliolina with - Origin shells, calcite fill, Textularia Rare nodular molds. Lithothamnion Other small forams Globigerinoides (21)

1120-1130 - No change

1130-1140 - Similar to that of 9-f^t except that there is a higher percentage of unworked clastic fragments.

1140-1160 - Fine fragments of cream colored + pinkish Ls, numerous fr. above - Except above temperature clastic Ls fragments quite rare + Ls fragments with chalky appearance rare to absent.

1160-1170 - No change

1170-1180 - Fine cutting, gentle fragments with chalky appearance. Predicably no sharp edged clastic fragments. Grains and coral fragments most numerous of recognizable organic remains but even these relatively few. Predictably none of the more mobile molds, red fragments as common as samples from 1100-1110.

1180-1190 - Similar to above - Rare but well preserved Echinoderms

1190-1200 Mostly shaley "gypsum" free rock. - Microcrystalline recrystals. Many round ferrous

1200-1210 - Similar to above - some white. Calcium in good preservation.

1210-1220 - No change - formation - 1220-1230 — No change -

1975-1978 - Mostly cream colored fossiliferous rock Calcareous, some clastic for cuttings

2000-2070 - Fine to Medium well processed coral fragments, fossiliferous beds. Few dense to fragments -

I believe this to be principally contamination in the hole - not that core is hard dense but with few fossils - that from 2070 to 2130 the cuttings are all uniformly hard white - & lack fossils.

2070-2130 - Sharp angular cuttings white almost crystalline to.

Little or no recognizable
organic material.

Sent Samples CC and DD
from core # 15 - 4526 - 4553
to WS Cole for age determination.
Both samples are unoriented pieces,
about 1½" diam, from immediately
above the bottom most piece of
oriented core.

Copper nitrate staining method for distinguishing dolomite from calcite

Copper nitrate is used as a 2% solution of copper nitrate in water. Polished surfaces of carbonate rocks are etched for 2 minutes in dilute HCl, washed in water, and dried. The polished surface is then covered with a few drops of the copper nitrate solution for 1 minute, rinsed briefly in water, and dried. Calcite is stained red, dolomite remains unstained. The stained surface of the calcite has a light blue-green color, whereas the dolomite remains (practically) unstained.

Treatment of the sample with a strong solution of ammonium hydroxide lightens the contrast nearly entirely. The calcite becomes a deep cupreous blue, while the dolomite is still slightly colored or not at all.

For best results the specimen should be compact and well polished. For such a specimen the following procedure gives the best results:

Solution used.

0.1 Molar solution of
copper nitrate. Prepared by

Solutions used:

(1 Molar solution of copper nitrate. Prepared by adding 188 g. $Cu(NO_3)_2$
255 g. $Cu(NO_3)_2 \cdot 3H_2O$
or 332 g. $Cu(NO_3)_2 \cdot 6H_2O$
to 1000 g. H. water.

(2 Strong solution of NO_3H (68 pc. reagent).

Technique of test.

The specimen is immersed in the nitrate solution in such a way that the polished surface is next against the bottom of the vessel. This can be done in a petrie dish, or similar container, with ground corner or edge. If the specimen resting on a small glass plate, rest this on wooden wedge. If the specimen is thin enough to permit it, it is best to cover the dish to prevent evaporation. Care should be taken that no air bubbles adhere to the surface.

Dimension stone is cut to size and shape at the quarry with a small polished surface not to be confused with calcite. The finer the polish and the less clear the material the more rapidly will the diatomite grains etch and absorb the color, and the less will the distinction between them and calcite grains become. For such surfaces and materials, and for specimens high in calcite, an etching time considerably less than five hours may be required. - It is difficult to give rules for the time required for each material, for a given specimen the time must be based on observance of the surface after short etching times. The way the material looks if the (Flexible) pencil tube of HNO3 solution is drawn uniformly over similar material, etc. If the specimen is such that a time much

When the specimen is removed from the nitrate solution it is immersed without washing and before drying in the NH_4OH. 0 Ten seconds is enough; more will do no harm. The specimen is then washed and rubbed to remove the excess precipitate. Before drying it is important not to rub a specimen or wash it violently after it is immersed in the NH_4OH, because the light green stain acquired in the $Cu(NO_3)_2$ solution will come off easily.

For further details of this test, and other staining tests, see

Rodgers, John: Distinction between Calcite and Dolomite on Polished Surfaces, Am. Jour. Sci., Vol. 238, pp. 788-796, 1940. (See p. 34 for results)

Results

Three core samples from site Flora were studied in the field, with the results recorded below; facilities were available for doing a real finish to the specimens, but a satisfactory core finish was not attained as follows:

a) A flat surface was obtained by using a machined metal sheet and a file. The specimen was rubbed on the sheet and [illegible] of the [illegible] Then dried down with [illegible] color [illegible] The [illegible] was [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

All [illegible] were dried off, [illegible] and [illegible] [illegible] [illegible] [illegible] [illegible]