Bucket —

Branch Acropora palmata

Agaricia agaracites ~~(Linne)~~
w/ Halameda

Porites furcata

Millipora alcicornis (Smooth)

Favia fragrum

Con #1 Club Sea urchin

Mactra mollusk

Sider asterae radians

Con #2 aveolata
~~Heanderina~~ ~~[illegible]~~ Brain
should be Manicina " "

Anularia

Pete - $4.80
~~MS - 3 fix & log~~
~~Ex 20 cove #9 fix~~

~~Guam R - Honrovia~~
~~Tongarira - ?~~
~~Canberra~~
Log all cores & label
→ Pedro's 4.80 -
~~$24 from Ships Store~~
Label corals -
Chips to Make Box for 159 - 168 Salinity
2.09 from Director for Stamps
Jam Air - Pre-Swan!
~~Raff want fish in over shoals?~~
Formalin for orifices?
To Jim Baker 1.93
$3.86 1.93
3.86

R.H. Stewart
Box 205 Balboa Hgts
C2

38 grass = 5,472 bottles
Released to date = 2,186
5 | 3,286
24 | 657 hrs | 27.
48
177
168
90

= enough for 27 days running time -

MSG -
Robert H Stewart, Chief Geologist
Panama Canal Co., Balboa C.Z.

Explorer ran trackline hydro & towed mag. across mouth of Charges R. in 22 fms on crs. 228°T to 9° 18.5' N Lat. 80° 5.4' W Long. x
No Sign of Sub Can Panel.

— Again — just the numbered pages — (1)

9 March, 1960 - 2000hrs.

Panama has come and gone, the canal has been transited, and the Explorer is now rolling along at a bit over 8°N toward Station 22, the first of 5 stations between Panama and the Swan Islands. Life already has settled down to the between-station routine. Mike Slapsys has the oceanographic watch, but the hourly BT's to be read and plotted and the 10 drift bottles every two hours make for a pretty easy watch, and when I left the lab a minute ago he was sitting on a stack of cases of salinity samples reading Decammeron.

Art Raff is working on his magnetometer recorder, trying to get into operation his system for ringing a bell ~~to ring~~ when the pen goes off the paper. Ron Reed and Santiago are getting some sleep before their watches tonight, and Jim Baker has started cancelling the thousand

and more envelopes that have come in to the ship to be cancelled "National Oceanographic Expedition, Swan Island." We will be at that job for some time to come. The hot humid tropical night has closed in on the ship and many of the crew have moved their pillows up onto the deck trying to find a spot cooler than the forward berthing area. One of them has a guitar and is strumming lazily probably remembering the well-built and lightly-clad Panamanian girls that lured many of the crew off the streets of Panama City.

In retrospect Panama is a ~~kaleidoscope of~~ composite of hot and humid days, a superabundance of diminutive and gaily-painted busses that run everywhere and every three minutes, an ~~endless~~ apparently endless procession of guests aboard all of whom got the complete

tour, the extreme hospitality and assistance ~~re~~ of people like Maurice Tewinkel, Col. Ickes, Col. and Mrs. Adams (all of the Inter-American Geodetic Survey) of Robert H. Stewart, Chief Geologist of the Pan-Canal Company, Luit Boerma of the U.N (F.A.O.) and all the others who were so helpful on problems ranging from getting sheaves and plantains to taking us shopping and to their homes for dinner.

To me, the high point was the trip Sunday the 6th across the Isthmus to Bahia de las Minas ~~where~~ with Bob Stewart (Box 205, Balboa Hgts., C.Z.) and Tony Mann. From the Pacific to the Atlantic in 1½ hours and back in the same day. I took a dip at Fort Amador after we got back, ~~just to~~ partly to cool off but also so I could say I had been swimming in both the Atlantic and the Pacific in the

Same afternoon.

The trip across was through lush green jungles that crowd close to the winding road, up over the continental divide, and down into the jungles on the Atlantic side. We left the main road south of Colon and headed northeast to meet the coast at Las Minas Bay where Bob is also consulting geologist to the dredging and filling operation that National Bulk Carrier is carrying out preparatory to building a large refinery.

At the small dock we loaded diving equipment and underwater cameras into a 14-foot dug-out made from a single log. This is the Panamanian cayuka, the standard dug out used along this coast. There was a 25 hp Johnson outboard on it, perhaps an anachronism but most helpful in getting out to the wreck we hoped to dive

on. There was a brief stop at the dredge. This is a real monster that ingests a steady stream of coral and mud from a long snout rammed beneath the water and excretes it through a long pipe leading ashore and into the area to be filled.

Leaving the dredge the cayuka headed directly into the sea and swell and we were all soon drenched, and a growing volume of water sloshed crazily over our diving gear in the bottom of the dug-out.

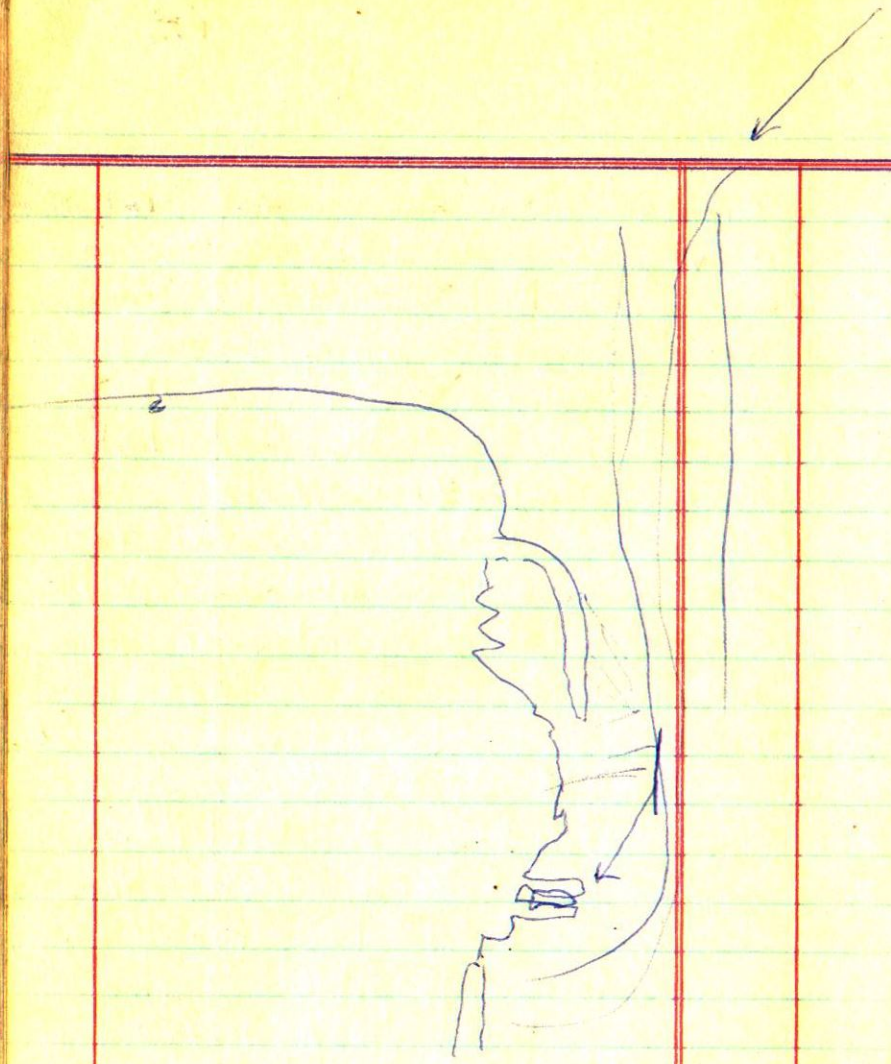
Once we had gained the wreck, we could see that the sharp line of demarcation between the turbid coastal water and the clear blue offshore water was still seaward of us, and the wreck was not visible through the water ~~made~~ thick with suspended coral "dust". It was like

swimmmy around inside a milk bottle, so we had to pass it up. Instead we found an area of clearer water inside the reef bordering the palm-fringed point that forms the northeast entrance to Las Minas Bay. No need for aqua-lungs here, so we just skin-dived. The back reef area was a magnificent sight to behold. Brightly-colored angel fish and striped seargent majors swam effortlessly ~~amoung~~ through a living garden of corals of all shapes and sizes. There were purple gorgonians, the sea fans, that waved gracefully back and forth with the surge, there were diminutive forests of the branching Porites and stately Acropora, many brown basket sponges, some up to a foot or more across, there were green and purple glass sponges and ~~the~~ ~~sall~~ small brain

corals (Meanderina and Favia). Wavey shaped Millepores were everywhere, the whole scene was one of many varied forms of marine life all bathed in ~~the~~ changing light patterns as the waves passed overhead. A large barracuda came by to look over the three strange intruders into his world, found us not too interesting, and left.

When we finally dragged ourselves from the water, we were loaded with coral to bring back. I had made several small piles on the bottom, and it took several trips back to the boat to get them all. If the Swan Islands are like that and with good visibility for photography, we will really be in business.

The night before, Byron Hale and I had worked long



getting the underwater movie camera ready to go. I had brought it up from the hold the day I filled our air tanks to find that the view-finder lens had been badly cracked - evidently in transit from Washington to Seattle.

Dr John Bradshaw who works with Dr Phleger at Scripps had provided me with a thermos jug and asked that I collect some water-line sediment for him in Panama and air-mail it back. He is studying living Foraminifera and is culturing specimens of "Rotalia" beccarii in its various varities in an attempt to straighten out the taxonomy of this group. I scooped up a tablespoon full of sediment - mainly broken fragments of Porites - at Las Minas Bay.

Staff - Mr. 12th

Dredge
Core
Dive
Census
Mammals & insects
Geology
Hale Photos of drift BMs
Lv. 19th
Mr MW 0800 22nd

@ 1500 2B came up un tripped
101M back to 2011 -
New Mess @

— Envelopes to NASCO, NSF, BOB —

Plan for Ex lines to 1000 fms

and it was shipped off to him — for $4.80 yet! — from Balboa.

We stopped en route back from diving at a quarry where the locals were getting rock for ~~concrete~~ cement. This, Bob told me, was a foraminiferal coquina of Oligocene age, and I asked him to stop. The Foram, I think, is Lepidocyclinae (underline) one of the large coral reef types. I picked up some good hand specimens and shipped two off to Fred Phleger along with Bradshaw's sample. The heat was unbelievable in that quarry. Not a breath of air was stirring, and the sun was mercilessly reflected from the white rocks. Hell must be like that quarry.

Monday evening - March 7th - Bob Stewart and Tony Mann came

aboard with their wives, and Tony showed four reels of his really excellent underwater movies. He has one sequence with a giant Manta Ray that is just excellent as are some of his close-ups of the smaller fish and corals.

Speaking of corals, I put those I had collected in buckets of fresh water up in the oceanography lab topside, and by Monday night the smell was almost overpowering, but Bob Stewart and I went in — thought of wearing an aqua-lung so I could breathe — and he has identified them for me. ~~Since then~~ I ~~have~~ put them under the high-pressure salt line while we were transiting the canal, and they are now not only better smelling, but are almost white. One more hosing and a final bath in clorox and a long time in the sun should bleach them pretty well.

Tentative identifications are:

Acropora palmata

Agaricia agaracites (w/ Halemida)

Porites furcata

Millipora alcicornis

Favia fragum

Siderasterae radians

Manicina areolata

Montastrea annularis

Gorgonia spp.

Mactra

Club sea urchin

Black, Green & Pink glass sponges

These I must label and get Byron to photograph.

The Director flew in on Friday afternoon, the 4th, and Capt. Jones, Cmdr. Bull, Cmdr. Stone Byron Hale, & I all went out to meet him along with Col Adams & Col. Ickes in their snappy staff cars. Admiral Moreno is now aboard, and will be with us until we reach Key West the first time.

The transit of the Canal was really most interesting. The Explorer slipped away from Pier 15 at 0700 the 9th of March and shortly thereafter picked up our pilot for the trip. We headed toward the entrance and slid along between the green banks to the Miraflores Locks. There small skiffs put out and brought cables which were made fast aboard — two bow and two stern —

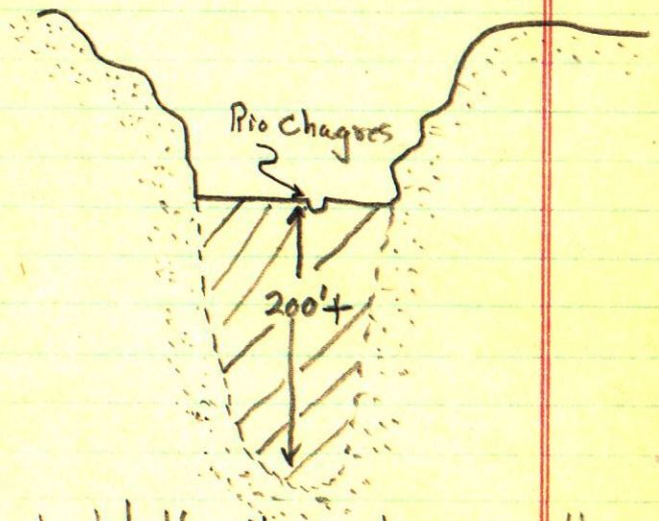
with the corer aboard.

We turned and headed toward Gatun Locks where again the cables were taken aboard and more doghounds shepherded us into the first of the three locks that were to lower us 85 feet to the Atlantic. Here a large and clean-looking British freighter, the Tongariro, shared the locks with us.

We dropped our pilot in Lemon Bay at Cristobal and scooted over to take our third set of cores for the Public Health Service.

The night before at Bob Stewart's, he told me of some borings that the Panama Canal Co had made in the Valley of the Chagres River. The Chagres rises ~~at~~ high in the hills of Panama, flows into Madden ~~Reser~~ Lake, a reservoir of water for the canal, then ~~into Gatun Lake~~ joins the canal at Gamboa. The Chagres was ~~dammed~~ blocked by an earth dam to form Gatun Lake, and the channel

from Gatun Dam to the Caribbean is a flat valley between steep rocky walls. Borings in the valley have shown that the valley fill extends over 200 feet below the ~~lev~~ present valley floor.



Undoubtedly this deeper valley was cut when sea-level stood at least 200 feet below its present location, probably during the Pleistocene when a large volume of water was locked up in the glaciers. This caused a general drop in sealevel that has been calculated to have been about 300 feet. What then happens

old valley of the
to the Chagres where it enters the sea?
When sea level was lower, the valley
must have extended out across the
continental shelf. Is it still there
as a submarine canyon, or has
it too been filled as has its
landward portion? Bob Stewart didn't
know and said he too had been
wondering about this, existing
charts, he said, were inadequate
to show whether such a canyon
existed. Here was a ~~ta~~ so-called
target of oppertunity, here was
something the Explorer with all
her echo soundrg gear could
easily determine.

I ~~broach~~ brought up the
subject with Captain Jones as
we were steaming through Gaillard
Cut in the Canal. I explained
what I had learned from the
Chief Geologist of the Panama Canal,
I drew a sketch of the old river
bed, and he listered eagerly as I
spoke of the ~~[illegible]~~ possibility

of the Explorer's solving this enigma. Commander Stone, as navigating officer and field works officer was brought in, and we spread out the charts on the circular table in the Captain's cabin. By running about 15 miles along course 228° after we left the Colon breakwater we would cross such a canyon if it existed. It was decided to try it. Total extra time involved would be about one hour.

Running along in water 15 to 25 fathoms deep, we paralled the shore a few miles off. I could see through the binoculars where old Fort San Lorenzo stood on the bluff high above the mouth of the Chagres. I watched the 808 fathometer and it was as smooth as a golf green. We drew abeam of the mouth of the river, and it was still

smooth. On the off-chance that the valley angled off across the shelf, we continued on course 228° several miles past the river mouth to 9° 18.5'N, 80°05.4'W. Art Ruff's magnetometer did show a slight dip (50 gamma) about a half-mile wide, but there were other larger magnetic features, so he couldn't even presume it to be the buried canyon. We turned back to a heading that would take us on to our first Atlantic Ocean station (#22). I worked up for Bob Stewart a message that the Captain sent out just after dinner, saying in effect we looked with fathometer and magnetometer, but we found it not.

We never know what we will find. If we did, there would be little use of going

to look. It would have been nice to have charted a new submarine canyon, and that place was a natural for one, but it is almost as satisfying to KNOW that there is not one there. Now we do know, and the barriers of ignorance are dented again.

March ~~Feb~~ 10, - 1900

I set-up for this leg, with the 100-mile spacing our stations have been coming fast. We arrived on No. 22 at 1830 last evening and on No 23 at 0850 this morning. Now it is 1900 and number 24 comes up in about 25 minutes. These stations have bottles only to 1000 meters, so they take only about an hour and a half even with putting the cover on as a cast weight on the second cast and lowering it to the bottom. Got good

cores on both of these stations, Our dark red-brown clays of the Pacific have given way to the buff colored highly calcareous sediments of the Caribbean.

Spent the afternoon getting our past cores all labeled and the tube ends cut off. I don't know how the Survey got started packing the upper end of the core liner (above the sample) with glass wool but we now are drilling a slight hole above the top of the sediment, blowing out the water, pushing in a cork to the top of the sediment, and then cutting off the extra liner above the cork with a hacksaw blade. The corks, both top & bottom are taped, the tube and jar containing nose sample are labeled and stored, and a descriptive log sheet is filled out.

Sta # 24 — #2 — wire 4 34° —
#1 " " 10°

Bth	Depth	Meter
~~Surf~~	0	161
14	1	149
16	10	140
3	20	130
2A	30	120
19	50	100
23B	75	75
5B	100	50
7	150	0

			Depth	Turns	
Surf.	0	(900)	0		
5A	200	700	200	55	
13 ~~21~~	300	600	300	54	
2B	400	500	400	53½	
8	500	400	500	53½	
23A	600	300	600	53½	
24	800	100	800	106½	(53¼)
~~13~~	~~1000~~	~~0~~		53	
center	(915)	0	(~~875~~)		

~~814 m~~
445 fm

1.83
600
~~1098.00~~

1.83
500
~~915.00~~

480

1.83
480
1464
~~832~~
878.40

1.83
183
20.13

Bottle 13 substituted for #25 which had a thermom that wouldn't break.

Bottle 5 still didn't b4 —

~~934~~ Ball broken

445
1.83
1335
3560
445
~~814.35~~

Sta # 25

	Depth	Meter	Bottle
	Srf	25?	- see it 1m below srf.
1	1 m	14	14
4	5 m	10	16
5	10 m	5	3
5	15 m	0	217

wgt. (swinging)

Sta #24

Max Smpl Dpth	800m
Water depth	814m
Cast Time	1:09
Wire ∡'s - 10° 34°	
Cl	14
O_2	14
Smpl, Yes	# 12
Line out to Smpl	934 m

Start	Dn	Mess	up
0528	0533	0539	0540
Bottom	bottle	no trip	back at
	0542	0548	0549	0550

It is now 2240 on the 10th, and we have just finished station #23. It took 1 hr and 9 mts only, but the depth was only 814 m. There was a good ball break with 934 m of line out (34° wire angle), but as Chief Lewis started to bring it in, the Rimco counter failed to register. I had him bring it up 17 turns on the drum (34 m??) to 900 m and got the samples with the bottles there. Coming in, I counted turns on the drum, so we can reproduce any depth down to at least 800 m. I left Angie Ferrera working on it as I came down and he has just popped in to say it is now fixed. Someone had switched off one of the two toggle switches on the box - almost like calling the TV repair man who takes it apart only to find the wall plug was out. I am glad it is fixed.

Since the next station is at

0550 I left a call for 0500 & should get some sleep.

March 11. 0610 –

Station #25 was in only 11 fms, but very shallow data can be just as important a deep data. We arrived at 0515 and we are now at 0610 just getting back under way. First off a core on the BT winch, but it just bounced – a hard bottom. We tried again and got a few flakes of calcareous matter ~~matter~~ stuck in the core catcher (Smpl# 13) but nothing else.

Bottles were put down at 1, 5, 10 and 15 meters, and the cast lowered to crushing depths of 25m.

Angie had not been awakened, why, I'm not too sure. He was quickly awakened for his velocity meter lowering and with that completed we headed on at 0605, slow at first as the magnetometer cable was payed out and now up to speed.

BT's were discontinued as we

came about midnight onto this area of shallow banks & shoals off Honduras.

0930 - Have made up some special envelopes to be cancelled by Jim Baker with the special Swan Island cancellation.

Argie Ferrara says that his velocity meter usually shows a marked increase of about 200 counts (~~to~~ adding about 120 feet/sec to the sound velocity) as the meter hits a muddy bottom. This morning, however, he got an increase of only 15-20 counts (adding only about 3 ft/sec) when it hit our 11fm bottom on station #25. This suggests little sediment, or a rocky bottom.

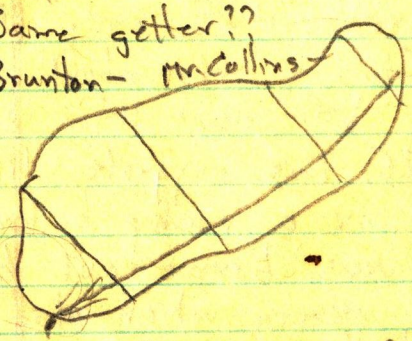
This was borne out by the sediment corer which also indicated rocky bottom.

2300 - This has been quite a day. This morning we had a long planning session for the first day at Swan Islands tomorrow. No sense taking

– Swan Island – 1st Day –

Stewart – H –
Reed – R –
Slapsys – M –
Santiago – P –
Ruff – A –

– Geology & Animals –
Get out Swan Is. Insect Mtl. from Mike –
4 → Hammers
5 → Knapsacks – Insect jar in each – watch –
~~→ Maps for the bags – each to make one –~~
~~5 → Field books –~~
Cameras? Wrist Compasses
Geol Hammer –
Same getter??
Brunton – Mr. Collins –



Ruff want magnetometer on survey??
last 3 days or so –

Swan Island – 2nd Day –

Stewart – H
Reed – R
Slapsys – M
Santiago – P
Ruff – A

1.83
100
1.83

— No accumulator —

BCF - Ia 3/11/60

A 1450 - start lower Blake dredge in 100 fm (183 m) to bottom
Let out to 400 m
@ 400 m 1458
1458 slow astern
1505 start in —
Recovery depth 105 fm
Thermom down 105 fm @ 1510
Bottom Temp - 19.7°C
up - 1514

Two cans filled - dredge bottom filled with fine calcareous mud. Main constituent was the abundance of large spicules - (glass sponge?) Tusk shells, ophuroides, one small flat fish, olivella-type shell. All in 2 cans plus much of the sediment. 40% formalin added 3 vol. Dredge turned inside out and dragged at surface to clean

150
183
450
1200
150
274.5

BCF Ib &c

B 150 fms (274 m)
558

depth 150 fms (274 m)
1544 start to lower to 550 m
1554 550 m out.
1554 Start in
1604 Messenger
Temp 14.7°C
1618 u/way for next Sta

Haul had little mud left, mostly glass shards again. One small fish, 1 shrimp, olivella

C BCF - 1-c
Depth - 200 fm (366 m)
Start down - 1630
at 366 - 597 m @ 1643
Start in at 1648
In at 1700
Bottom Temp. 12.3°C
Several large - 8-10" ophuroides, one fish, more sponge spicules, but this haul held long (12-14") threads of "glass wool" - sponges? One solitary coral.

250
1.83
750
2000
250

BCF - Trawl 1-D 457.50

Depth 250 fms (458m)

1724 Start down time to 750 m.
1738 at 750 m - on bottom
1743 start in —
1757 in —
Bottom Temp 11.3°C

Smallest haul yet - 3 large brittle stars - no fish, no long spines, lots still of sponge spicules. Mud had washed out by the time it reached the surface -

183
300
549

BCF # 1 E

Depth - 300 fms (549m)
Start down - 1810
850m out @ - 1825
Start up - @ 1831
Bottom Temp 9.7°F
Dredge up @ 1845

One big orange many-armed ophiuroid??

Sta #26

Bottle	
Srf	161
14	149
16	140
3	130
2A	120
19	100
23B	75
5B	50
7	0

Srf.	0	510
5A	200	310
25	250	260
2B	300	210
8	400	110
23A	450	60
~~24~~		
Corr	510	0

Start down – 1858
Down – 1905
Mess Down 1911
Start up – 1912 ~~4~~
up – 1916

Start Dn 1921
Down 1932
Mess 1938
Start up 1944
up 1952

300 fms

Cndr. Bull – Accumulation to come on track to Tray Wharf ?

280
1183
840
2240
280
5124

4°

Bull bk @ 561 m @ 1931

2130 – 2146
980 to 20 fms

in deeper water. After lunch Ron Reed, Byron Hale, and I worked on the Rolleimarin, our good underwater still camera. Some screws and the film turner had worked off during shipment, and it took us nearly 2 hours to get it back in shape.

sleeping time tonight to spell out plans. I'll wait till tomorrow night and see how they worked out.

Sta # 26 was due about 1400 this afternoon with the first bottom biological dredges for the Bureau of Commercial Fisheries due a few hours later. At lunch the Exec & I hashed over the possibility of ~~pos~~ moving up Sta 26 till after the dredges so that this new dredging operation could be carried out in daylight. We decided this was better as it would also put Sta 26 → We rigged the BCF dredge – a modified Blake dredge – on the starboard anchor davit to be lowered & recovered with the forward winch & 3/8" cable. We made 5 hauls between 1450 and 1952. The details are listed below. There is no accumulator or dynamometer on that winch and I am leery of what will happen should we get a good solid hang-up. Fortunately the bottom was all a fine calcareous ooze,

and we got samples and dredge back on each of the five runs, what will happen when we dredge for rock, I don't know. Perhaps we can have one of the big wire-drag accumulators come to Key West on the truck.

The dredging drew quite a crowd, and the camera club was again out in full force. They really were quite in the way until Dennis hooked another shark, and they all moved off.

The first four dredgings (in 100, 150, 200, ~~25~~ and 250 fms) were all quite the same. The main constituent was sponge spicules, (?), sharp transparent spines that would stick into ~~your~~ my hands as I put the material in formalin. There were tusk shells, an Olivella type shell, one small flat fish, and numerous small Ophuroides — the brittle star — related to the starfish and sea urchins. The 2nd brought up much the same

As each dredge was being recovered a single reversing thermometer was lowered to the bottom on the BT cable and a messenger sent down to reverse it. We thus have a bottom temperature for each dredge.

about two-feet from tip to tip

but with long pieces – up to a foot long – of very thin tough glass wool. That is really what it looked like, about the size of a pencil lead and transparent. I assume they are either from some sponge, or they may be the spines from an echinoid that I am not familiar with.

The final dredge was in 300 fms, and though the bag held only a scattering of small stuff, a big beautiful bright carrot-colored 12 armed Ophuroid was brought up clinging to the frame. Since we started station 26 as soon as we finished dredging there was little time to ~~sweep~~ look at it closely, so I put it in formalin with the other material from that haul. This evening I looked it over more carefully, but true to its common name – brittlestar – all 12 of the arms had broken off the

central portion. I fixed it up on deck with the arms arranged around it & Byron and the Director both took pictures of it.

Then back to the plotting room to see how the tracings of the Swan Islands photo-map were coming. These we are to use as we track rocks on the island tomorrow. There had been some confusion, I guess, for they had not been started. I got Santiago and Reed to help me, and we traced ~~traced~~ off five.

I was about to turn in at 2130, for I must be up at 0600 to get ready for the island tomorrow, when I was called to the bridge. We were then on the crest of a fine 18-fm. shoal in an area where the chart showed around 300 to 900 ~~to 900~~ fms. The bottom had risen from 980 fms at 2130 to

only 20 fms some 16 minutes later. The Capt., Cmdr. Stone, and I talked it over. Since we were early and would arrive at Swan about 0300, lets look this thing over! So now at 5 minutes after midnight we are on our second pass over the top at 16°54'N 83°13'W

We cored about ten o'clock. Poor Mike uporski had been at it all day, and had just gotten to bed, but back he came all interested in the shoal and our sampling of it. The corer just bounced the first time. Mike had 130 feet of BT line out, and you could see the wire slack off at the sheave as she hit. On surfacing, I could tell she was empty as the water just poured out. This looked like a rocky bottom, but we tried again. This trip we got a 4-inch core of solid rock. That heavy

Subsequent to my writing this, ~~that~~ Art Ruff looked over his records more closely and it does appear that magnetic rocks do outcrop along this bank. It will be interesting to see his magnetic chart of this when it is all worked up.

corer just punched into the coral, ~~and~~ like coring an apple, and the sample was stuck in the core catcher.

The coral was not living. What could have killed off what must have once been a flourishing reef? The magnetometer showed not the slightest change, so at least it wasn't a coral crown on an old volcano. Evidently the corals had started to grow upward when sealevel was some 180 fathoms below its present stand. As sealevel rose, the reef building corals were able to keep pace and ~~were as~~ built upwards staying near sealevel. Why did they stop this and allow sealevel to continue rising while they died? They may have been killed during ~~the~~ Pleistocene time when the seas cooled off as the glaciers moved down from

— BCF Dredges —

No.	Date	Depth (fm)	Line out	Dredge time	Total time	Bottom temp
1a	3/11/60	100 – 183	406m	07"	24"	19.7°C
1b	"	150 – 274	550m	05"	30"	14.7°C
1c	"	200 – 366	597m	05"	30"	12.3°C
1d	"	250 – 458	750m	05"	33"	11.3°C
1e	"	300 – 549	850m	06"	35"	9.7°C

the north. Cold water – ~~below about~~ will prevent reef growth. Since the Pleistocene sea level has been reckoned to be about 50 fms lower than now, some ~~uplift was~~ post-Pleistocene uplift must have taken place if the reefs were killed by glacial cooling. On the other hand, it may be that a change in the current pattern either cut off the food supply for the coral polyps or brought in killing cold waters. A violent eruption of a Central American volcano may have smothered them with ash. It is not known why they died but we are now running a survey over the bank that might shed some light on this.

It is now 0030, and I have a call in for 0600, so it – finally – is bed.

Iguana to be stuffed
Reef el al - tide rolls
Catch up notes

Tuesday, 14 March -

It is now three and a half days since the last entry was made. Three and a half days of exciting new things, of a few and relatively unknown couple of islands, of small skiff landings ~~good seas~~ at the base of steep coral reefs, where there are only big reef blocks, no beach, and where the skiff rises and drops 6 or 8 feet at the jagged face of the reef and a man or some equipment gets ashore each time a wave raises the skiff to the tiny shelf. Three and a half days of walking and collecting, knowing again the relief that can come from drinking ~~coconut~~ milk from a fresh-cut coconut on a hot afternoon, getting used to seeing the large ugly land-lizards - the iguana - ~~looks~~ watching you from the jagged tops of the upraised limestone reefs, three and a half days of

blazing hot ~~sun~~ Caribbean sun, beautiful full-moon nights, rocking launches, ants in our lunches, dense jungle, clear warm water, sore feet, cut-up shoes, sunburn, sweat, and interesting information. ~~collected.~~

Now at 1400 I am out on the foredeck with one of our double-70 air tanks hooked up to the little compressor. I'm sitting comfortably writing and glancing occasionally at the pressure gauge as the tank fills with the air. Ron Reed & I will use tomorrow to sweep the underwater reefs along the north coast of Great Swan Island.

At that point Cinder Bell showed up wearing shorts, sneakers, and the blue visored cap that keeps the sun from his balding head. We hashed over the plans for tomorrow and as he left the Director came out and we talked for nearly an hour. It is now—

nearly 1600, and the least tank is nearly full. They take over a half hour apiece to get from 1000 to about 1500, & the first 1000 is a really long pull, as is the stretch from 1500 to 2000, so I try to jam air any time they get much below 1500 & bring it back up to 15 or 1800.

The survey on what I will call Explorer Bank was terminated in order to put us at the anchorage on Great Swan at 0800 on Saturday the 12th.

Again there was an interruption and it is now 1300 on the 16th, and the Ex is running hydro lines back to Explorer Bank and across it to wind up the development survey there. The seas at Swan were too high for satisfactory launch hydrography, so today we are working with the ship and tomorrow Cmdr Bell, Reed, &

I hope to wind up the diving. Yesterday was a full day of work underwater on the reefs off Fowlers Bay on Great Swan – but I am getting ahead of myself.

Just heard that one of the 20-odd live iguanas aboard has died – so I will interrupt this again to go clean him and inject formalin into him so he will preserve for the Nat'l Museum. Will wear rubber gloves, as my hands are all cut up from the corals yesterday, and I have no desire to get formalin in them.

It is now 1430 and I have just finished autopsies on two iguanas. One Byron Hale got with the Nat'l Museum's game getter gun three days ago. It had not been cleaned or injected, merely dumped into formalin with Borax added as a buffer. That one was really ripe, and even way aft on the upwind side of him, it was

a pretty exciting olfactory experience — my, but he did smell. Milsted, the Corpman aboard, fixed me up with surgical gloves, scalpel blade held in a hemostat, scissors, and a syringe — don't touch me, nurse, I'm sterile — and young Dr. Malone operated out on the fantail. There were quite a few of the crew watching until I opened the old one, and somehow they lost interest fast. I even thought of wearing ~~an~~ an aqualung so I could breathe clean air — it was pretty bad.

Both now have been slit from anus to ~~bre~~ sternum, all viscera removed, and the leg muscles and tail have been injected with formalin. They are now in one of Nordahl's battery cans labeled

Great Swan Island, W.I.
<u>Iguana delicatissima</u>
Collected by Useless Explorer
March, 1960 for Dr. Doris Cochran
Division of Reptiles
U.S. National Museum, Washington D.C.

12 Sat - St. Swan Geol, Plants Insects
13 Sun - St. Swan Jacobsen bay
14 Mon - Little Swan Geol
15 Tues - Aboard - ready for diving
16 Wed - Diving - Man to little Swan
17 Thurs - Hydro
18 Fri - Diving -
19 Sat - Hydro & anchor

19 March, 1960 0930

Quite a blow Thursday and Friday the 17th & 18th from the southwest made the southern coast of the islands a raging white-capped hell, and the launch hydrography just couldn't be done. On Thursday the Ex ran hydro lines, and on Friday she ran some lines, put a launch over to wind up things on the island, one for Cindr Stone and Argie who were still working on the control net, ~~[illegible]~~ telerometer, and magnetics, and a launch for diving.

Rather than go back and try to thrash out each day, I feel it best to cover each subject: geology, plants, insects, mammals, reptiles, and birds:

Geology

The complete regional geological picture can be gotten from the literature

once the trip is completed. In brief the Swan Island Platform is an isolated rise on the south side of the Cayman Trough. The islands lie along what Taber (1922) has called the Swan Islands - Jamaica - South Haiti fault~~zone~~ zone. To the west the islands align with the Bay Islands off Honduras (Utila, Ruatan, and Bonacca) where young basalt flows are found, and further west the trend is continued by the Sierra de Omoa of Honduras. Schuchert (1935) and Taber (1922) both ~~believe~~ advance the suggestion that the Swan Island platform is a horst, an uplifted fault block. Field examination of the surface rocks on both Great Swan and Little Swan Islands revealed no evidence to support this horst hypothesis. Rather it appears that Great Swan Island is ~~an uplifted~~ composed almost wholly of calcareous material with an ~~outer~~ upraised outer limestone reef ~~of~~ protecting the central flat portion.

Insert

Along the northwest shore of Great Swan were collected several pebbles and small cobbles of a dark igneous material shot through with quartz veinlets. No outcropping of this material was seen anywhere on either island. These rocks were in each instance well rounded attesting to a prolonged period of marine abrasion. What is their source? Although ballast from a ~~nearby~~ sunken ship, kelp rafting, and transportation by ~~sea~~ marine mammals and small boys who like pretty rocks, were all considered, these are probably all incorrect. Magnetometer surveys around the islands using the towed magnetometer revealed only one small irregularity off the northwest shore of Great Swan Island. This suggests a small intrusion of magnetic material into the otherwise calcareous mass of the island platform. Therefore it is believed that these igneous pebbles and the similar one found by Capt Jones on the NE end of Great Swan are derived from a small intrusion outcropping underwater

Beachrock guano

Dining

that these unconsolidated sediments could not have remained while the reef was building up.

All of this is conjecture of the purest type - the type that geologists are so fond of - but studies of the samples collected should ~~d~~ reveal the relative age of the ~~reef or~~ outer reef and the inner sediments.

Insert here

The detailed local geology will be written up when the 60 or so photographs have been developed. The 89 rock samples that were collected from these two islands have all been positioned on a map and each has been wrapped in a separate envelope. Two boxes of Great Swan Island rocks and one from little swan have been labeled and put below to accompany me to Washington. These will go to the USGS along with my report.

Sta #27

4500
1815
2685 (new bottom)

15 O_2, 15 Cl

14
16
3
2a
19
23B
5B
7
1000 → S.F
5A
25
2B
8
23A
24
13

Wire ∡ 15° & 12°

Start	Dn.	Mess	Start	Up
2020	2033	2039	2040	2045
2049	2243	2249	2254	15

2700
2800
Wind 25 mph

Depth 2435

2500
1.83
7500
20000
2500

2455
c
14,73 c
Reset

(200)	S.F	1011	2031	2031	226
	200	800	1800	1815	0
(100)					
	300	1700	1700	1715	
(100)					
	400	600	1600	1611	
(100)					
	500	500	1500	1508	
(100)					
	600	400	1400	1405	
(200)					
	800	200	1200	1202	
(200)					815
	1000	0	1000	1000	
(1000)					
	Cover		0	0	

Bottom 4493

2455
1.83
7365
19640
2455
4492.65

2120 Meter wheel going in wrong direction - no knowing when switch was bumped have to bring back to top bottle and zero.

New bottom @ 2685

No Ball bh @ 3300 + 1815 = 5115

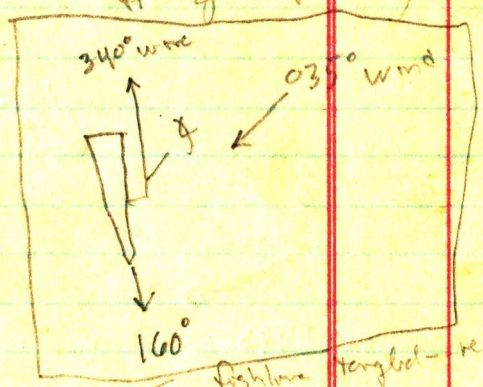
~~Complete List to Director~~
Book to ITGC
~~Stamps~~
~~Memo to Capt on Flag~~

Cores brought up to date
~~Stuff to Rath~~
~~Fix bottle rack~~
~~Winch repair~~
Thiosulfate
~~Fix wire snake~~

2nd

Just couldn't get the right combination of wind, crut, & steering to get good ↓

Srf.	(1031)
5A	815
25	715
2B	611
8	508
23A	405
24	202
13	0



fishline tangled - re-done

	Start Dn	Dn	Mess.	Start up	Up	Wire ∡
1	0836	0845	0851	0852	0857	16°
2	0902	0913	0929	0934	0945	36°
3	0956	1048	1050	1110	—	50°
		1154	1154	1213	1256	50°

When 2A came up @ 2522m it had not released its messenger 1137 hrs it was relowered to 4580 to try again to get the bottom 3 samples

Sta #28

20 O_2 20 Cl

2415
1.83
7245
19320
2415

Wind 035° 4419.45
Seas - 4' from 035°
Swell 055° 4'

	Depth	uncor. Meter wheel	Used Meter wheel	up Rdngs
Srf	0	4500	4580	4580
	1000			
3	1000	3500	3550	3543
	1000			
2A	2000	2500	2525	2522
	500			
19	2500	2000	2015	1993
	500			
5B	3000	1500	1510	1501
	1000			
7	4000	500	500	
~~4000~~ 20"	500			
	Corer 4500	0	0.	

2415 - 4420m

No Ball break at - 5000 - extra 580m

~~Stop @ 4900~~

Thiosulfate needed?
Chem-wipes—
Stuff to Ruth

Check out Zether et all on O_2 —
Koczy 22-25

Plants

On Little Swan Island, the flora is dominated by cactus, sea grape, and the succulent, locally called "sea ~~t~~ lettuce."

It was on Little Swan that Mr. Harry Glidden who lives on the other island pointed out the "touch-me-not" vine. He claims it to be "deadly poison", and that cows feeding on it are dead within 24 hours. A sample was collected, and a potato-like tuber found

separately was said by him to be the root of the same vine. This too was kept.

The sea lettuce and a small sage-like bush grew in the solution cavities and in the minor irregularities on the top of the highly eroded upraised reef on both islands. When these plants reach the general surface of the reef, they grow no further, probably kept at reef level by the wind and salt spray. The

end result is most treacherous when one walks across what appears to be a smooth plant-covered surface. The rocks are extremely sharp and jagged and the holes, some as much as 50 ft deep, are well camouflaged (spelling?) with these plants.

The cactus so common on Little Swan is found only occasionally on the larger island and there appears to be limited only to the peripheral uprarsed reef.

Fowlers Point, but it will be quite a few years before they begin. In the meantime the population has dropped to only 22 islanders. They plus the 6 Americans attached to the Weather Station and the FIFA station make up the total population.

Aside from the area of the former coconut plantation, the cleared area around the buildings at the west end, and the small garden where yams, coconuts, bananas and papayas are raised, almost the entire

Cy-6-2492

about 0.1N $Na_2S_2O_3$
dissolve 25gm. in 1 L of
distilled H_2O -
bottle w/ CO_2 here?

— At Key West —

1) Call Mr. Charles T. Witt
BCF Room 317, PO Bldg. Key West
CY-4-1921 - 6 cans of pickled dredge animals
& Thiosulfate

2) Where are BCF smpls & plants, insects, etc.?
~~Pictures prontu to LIFE~~

3) Work up BCF Smooth Log.

4) Complete list of what's been done for Kano

5) Thiosulfate? & Chem. wipe?
~~$4.80 to Pete tour by~~

6) Zetter, Dinardi, & Cummings on O_2 etc. - Reed
Plug-ins - Khaki Shirts - not flowered - no vine seat.

7) Koczy 22nd to 25th - Roff to Miami?
- Copy drift bottle records for KGC -

8) Stuff to Dr. Blackburn
New rocks in Ocean Lab.
~~9) Fix up last core & box 'em all.~~
9a) Vary to fix thrust washer on winch? Counter?
~~10) 8 days Comp. time for boys on shelf -~~
~~11) What is dead in balloon shelter?~~
12) Films, gifts, weeds, Indry arhive ($?) envelope?
13) Accumulator through Fritz?
~~14) Iguana Photos?~~
~~15) U/W films to Hale -~~

boil water
fund to remove CO_2

Ship — EM-1-5456 (287 or 297)
CY-6-3511
8-353

(46)

island is covered with a dense and literally impenetrable tangle of trees and underbrush.

There are some trails. The main trail runs along the narrow-gage railroad track that extends from the landing back to the old guano diggings near the eastern end of the island. This trail continues on east past the old pits and comes to the coast at the southern end of Jacobsons Bay. A branch-off from this trail at the east end of the former palm grove runs south to Smith Bay and comes to the shore where cattle marks in a wet mud wallow show where some fresh water was coming to the surface.

A second trail to Jacobsons Bay leaves the old railroad and runs northeast through dense underbrush and reaches the bay at the north end of the sand beach near where some diggings have been made for buried treasure.

At the prominent large wild fig tree some 150 yds east of the settlement a trail swings north through thick underbrush and terminates at Fowlers Bay.

Incidental MM for State Dept. Report. —

Landing area is good water for small boats. Concrete pier and small storage sheds are there as is the terminus of the railway on which push cars can be used to move gear up into the settlement.

Enumerated by the Explorer

1960 Census showed 28 people on the island: 19 Cayman Islanders, Mainly Gliddens and Smiths, 3 Hondurans, plus 6 Americans attached to the WB and FAA.

United Fruit has no more installation there. West end of Great Swan totally rebuilt after hurricane.

Mammals

Goats introduced to ~~Great S~~

Little Swan some 5 yrs. ago have all died off. Several cats left there several years ago are still alive and were seen by Explorer personnel. The Hutia (Geocapromys thoracatus) formerly found on Little Swan is now apparently extinct. The 5 men from the large island that went to Little Swan to get some for us not only saw none but said they saw no droppings. This, they said, had been the case since the '55 hurricane.

— Reptiles and Amphibians —

Most common was the large iguana, Iguana ~~delicatissima~~. They were most common along the seaward edges of the reef on Little Swan. They are ugly devils with their fringed backs, dangling throat pouches and general Mesozoic appearance. Ships personnel caught several, and

We did, however, get three of the small (5-inch) snakelets that are on the islands. One has some died, and he too is now in formalin.

The only turtle I saw was one small very dead one ~~on~~ on the beach of Smith Cove. He was covered with heavy sticky tar that evidently caused his death. Robert Glidden says there are 3 turtles that inhabit the waters of the islands — the green turtle, hawksbill turtle, and loggerhead turtle, but none of these was seen.

No birds were collected and solely because I didn't have the heart. With the Nat'l Museum's game getter barrel and loads for the Survey's .38 pistol, I could have, ~~but~~ rocks, reptiles, insects, and plants I collect, but at birds I drew the line. On

Little Swan both the Boobie and the Frigate Bird nest in great abundance, and there I did shoot but with my camera. The Boobie nests on the ground on Little Swan in areas where there is a little soil on top of the reef. Sometimes they would leave the 2-foot area of feathers and feces that is their "nest" as we approached, but more commonly they would screech at us and flap their wings making short ferocious lunges to peck at our legs. Harry Glidden says they lay only 3 eggs and then feed the chick from only one, allowing the other two to die off. In several "nests" I saw one healthy one and one or two very scrawny ones. The mature Boobie is a fine flier, and they warbal constantly along the steep front of the upraised reef.

19 90
20 192
21 274
22 79
635

[27½ since 0400 ~~14 dist~~]
51.5
79

There were numerous young downy Bobbies setting in the low sea grape trees. They were not yet able to fly but would stare at you as you approached and open their beaks noiselessly in protest.

Also in these trees were many Frigate Birds, the older males with a big red pouch at their throats ~~as a~~ as though a sign of the respect ~~their age~~ to which their age should entitle them. These birds with their delicately forked tails are beautiful soarers and the air was full of them over Little Swan. Other birds include a wild pidgeon that was always just out of ~~sit~~ sight - evidently they are very timid and fly at the slightest noise. At the marsh on the north side of Great Swan I saw both

they

felt

the white heron (?) and one that was a dead ringer for the small green heron from central New York State.

The insects were collected, but I know little of what they are. We poked under logs and stones, but our best pickings were from spider webbs. They had done a fine job for us, so we did lots of collecting from the webbs. The owners of these webbs were not slighted either, and they too ended up in our killing jars and then into the pill-boxes provided by the Nat'l Museum. These spiders were a curious shape and had a bright yellow spot on their back. These insects are now in ~~either~~ either alcohol or in the small pill boxes ~~the museum~~ ~~supplied~~.

Travel on foot on Little Swan

is almost impossible. All of us can attest to the difficulty of getting ashore on Little Swan - Cmdr. Stone and Angie got up with the Tellurometer and the T-2, Ens. Allen and some of the crew got up at several places to put up the wood and bunting signals that are used for launch hydro, and the oceanographers and Hale got up to knock rocks and ~~the~~ be collecting naturalists, but almost all of us have a scar or two to show for our travails. The ~~co~~ upraised reefs of which this entire island is composed rise precipitously an estimated 30-60 feet above the sea. Here and there along the coast there has been a slide, great jagged blocks of the reef have been torn loose in some past storm or earthquake. At these places access to the top can be gained by working around and over these car-size blocks. Offloading people & gear was a pretty exciting task and required good seamanship with those small skiffs. The trick is to-

pull the ~~nose~~ bow in close with a man ready to jump ashore as the skiff rises high on a wave. He takes the bow painter with him and hangs on as the sea drops away and the skiff is sucked down and seaward. The outboard is then put in reverse and the skiff is eased in with the line but always ready to back off in a hurry. As it rises high to the rock, another man jumps or more equipment is passed over until all are ashore.

The top of these reefs has a very jagged surface where the limestone has been eroded into sharp peaks. The walking is most difficult, and shoes are badly cut and torn. A fall here would be pretty bad, a misstep so easy. My shoes have ~~gone~~ since been consigned to the deep, and my tennis shoes are - as Peter DeVries might have said - on their last legs.

23 March - sometime in the afternoon -

I'm now in a completely different world - I know just how Alice in Wonderland must have felt - my looking glass was the narrow strip of water separating the ~~a~~ Ex from the pier at Key West, and now some 30 hours after we came in I am sitting in the sun beside the pool at the Atlantic Shores, Leelee is beside me knitting and life looks great. It is, however, a different world completely. As we came slowly up the channel toward Key West, I broke out the long glass, and there she was with Cmdr. Whipp, Joe Nelson who came from Canaveral for the Telluriometer, and ~~with~~ Daisy Hole. She looked awfully good to me too. I had ~~arranged~~ arranged it so I could take off for 4 days, and after a buffet lunch in the ward room we left.

It will become increasingly difficult with time mentally to go back through that looking glass and recall what happened on that other world. However,

If it is not done now, it will probably never be done, for once we have left Key West for the week's work in the Gulf & the Yucatan Channel, things will be happening too fast in the present to allow me to go back to recreate the past.

We put in something over five hours underwater at the Swan Islands, Ron Reed and I. The first day we worked the reefs of Fowlers Bay on Great Swan, and wound up with a dive on an old wreck along the reefs north of Little Swan. The second day Commander Bull came along and he too dived with us, as did Byron Hole. That day we operated off the north shore of Great Swan ~~east~~ between Northwest Point and Fowlers Bay.

We set up the small air compressor on #1 motor launch and had a tank on it all the time, we would come up from a dive - averaging 34 minutes - and two more tanks would be just about

ready.

The reefs were not so lush as those at Panama. Gorgonia were abundant as were ~~#~~ the stag-horn Acropora, but the brain corals and ~~#~~ Porites were much less common. However, the fish were much more abundant and their colors more ~~#~~ brilliant. The one we especially liked was a 1-2 inch dark blue fish with brillient luminous lighter blue spots on it. This one lives ~~in the coral~~ among the corals and seldom gets more than a foot or two from its own little area.

Naturally I was out of film when I saw the only shark. I think it was a nurse shark but didn't wait around to see. There were several large barracuda, and I shot up a sequance of movie film in chasing a large one - about 4-5 feet long. We shot up a total of 800 ft of color film but I have my fingers crossed, we will just

have to wait and see — and hope!

Saturday the 19th, the ~~wi~~ wind had shifted, so our anchorage on the northside was no longer a protected one. We were under way early and put off Cmdr. Reed and Ens Moses in boats 2 and 3 to try to fill in the launch hydro on the south side that the high seas had prevented them getting before. Cmdr. Stone and Hayes fought their way back for more angles. They all did well, and the boats were back aboard by 1400, and we were underway from the Swan Islands. We had put up 18 hydro signals, run Tellurometer & Theodolite surveys, run 142 miles of launch hydrography, occupied two magnetic stations, had samples of the plants and insects, 89 rock samples, 10 doves, 500 ft of underwater movie film, had taken the Census ~~of~~ — 19 Cayman Islanders, 3 Honduranos, and 6 Americans attached to the weather

we also got 21 live iguanas - 18 now - and a batch of small lizards that reside happily in a big solid cage.

Station and the FAA radio marker station, we'd shown movies ashore, stocked them with needed food, & took their mail. It had been a good stop and the ship was loaded with smelly fan ~~corals~~ corals and many of the men had started to peel pretty badly - looks like some terrible social disease.

There has been a good deal of interest aboard in our live cargo. I'm constantly asked "Doc, how is your family today?" Don't really know why they consider 18 ugly iguanas as being MY family, but I assume it to be complimentary - life is easier that way. There must have been 20 people that told me the third one was dead "Hey, Doc, one of your family died last night". Just so I could stop saying "Thanks, I know it", I finally got the keys to the cage from Chief. Bull, and I opened the cage while Green,

(Insert)

We had been steaming on the wire in an attempt to keep the wire angle down, but a new combination of wind and currents gave us an angle of over 40° toward the stern. ~~Even~~ With the wind about 10° off the port bow (winch is on the port side) blowing at 25mph, I assumed we would drift down-wind, but his high angle astern showed something other than the wind ~~was~~ and stronger than the wind was acting on us. I asked CMPR Reed to stop the ~~ens~~ ship and let it fall off the wind. As she fell off to her lee-top heading, the angle became less and less. The bottles were lowered to their tripping depth, the messenger sent down, and after allowing enough time for the messenger to go down - assuming 200m per minute - the string was sent on down to

going the wrong way. I had him stop while I thought what to do. Here we were with something over 2000m of cable out trying to get a core, and we didn't know how much we had out. The hitch was that ~~since by steaming on the wire we had the wire angle down to almost zero, I had decided to~~ if we went on to the bottom - if the ball-breaker worked - we still would not know at which depth the bottles were tripped. There was nothing for it but to bring the whole string back up until the top bottle broke the surface and then re-zero the counter, ~~had been~~ ~~Then back down. Since we were steaming on the wire and had an angle of only about 5° - even in a 25-knot wind and fairly heavy seas - I decided to trip the bottles at their proper depths and then go on down to~~

get a core with the Phleger corer some 1000 m below the bottom bottle. The bottom was then at 4493 m – nearly 3 miles deep – and even with 615 m of extra cable out there was no ball-break. Had we reached bottom ~~or no~~ and the ball-breaker not functioned, or had it never reached bottom?

Six hundred fifteen extra meters certainly should have done it, and I was leery of putting our bottles on the bottom, so I had them start in. Admiral Taro was sharing the earphones with me – I wanted him to hear how the ball-break sounds on the PDR. I should have know that that would be the one time it didn't work!

She started the long pull in from 5115 m at 2254 and some 30 mts later all bottles were aboard and the corer broke the surface. No wonder we didn't

turn

get a ball-break! There was one ~~solid~~ ~~loop~~ of cable solidly looped around the ball-breaker preventing it from having released, but there was a good core of calcareous ooze - Number 18.

On both station 28 and 29 we had the same combination of winds and currents - evidently a fairly strong set toward the northeast. On 28 even with 580 extra meters out ~~the~~ the corer never reached bottom. The third or deep cast had an angle of ~~abo~~ 50° - we just couldn't cut it down with any combination of steaming and wind. It was so steep an angle that the ~~4th~~ bottom up from the corer (at 2000 m) had not released its messenger. Nothing for it but to put the string back down and try again. This station took over 4 hours, but we did get water samples to 4000 m.

Twenty-nine again had wierd conditions. With a lie-to heading of 145° and a 25 mph wind from 045° the wire still went under the ship. With the magnetometer out, we couldn't back, so as each bottle came to within 20m of the surface, ~~I had~~ CMDR Reed kicked the ship ahead and gave hard left rudder. This moved the stern away from the wire enough to get a bottle up before the ship was back on the wire. It took quite a while, but we did get all the bottles back even though the bottom two had not tripped. We got a good core too even though the ball-breaker had not tripped again. This would have been a good spot for some current measurements, but the equipment was awaiting us at Key West, and time was running out on us.

That night - the 20th - I got up

to watch the sounding on Arrowsmith Bank. We did get a shoal of 10 fms (check this later to be sure) but not the 9 fm shown on the chart. A pass across where the 7-fm shoal had been reported showed nothing, but we will try on the next trip down there.

We arrived off the sea buoy at Key West at 0800 having BT'ed and drift bottled our way up along the Cuban coast and across to the Keys.

The current equipment was awaiting us and is now all aboard. Joe Nelson has gone over the Tellurometer with Argue & CMDR Stone and has returned with it to Canaveral.

I have talked twice to

conscience for being away from it all for four glorious days with Elise.

Will at the same time get this off with film to Captain Crosby and answers to the various bits of correspondence that seem to have tracked me down even in Key West.

I can well imagine what an interesting recollection you will have when you read this over again a few years hence —

KGP

April 1960

Berth-

2 net rings
2 nets
2 pens
1 ml pipette (2?)
1 box net parts
2 depressors
1 box " hardware
Samples-

From
To
16—15433

Course	Wind Dir.	Wind Force	Remarks (Current, Sea, etc.)

0600 2 March 1960

Planned position for PHS#1 could not be occupied as a ship was anchored there.

Lat: 08° 52' 33" N

Long: 79° 30' 28" W

Depth: 59 feet, Chart #0

Two cores were taken:

PHS-1A was good. The top of the sediment is at the top of the core. A separate jar contains the nose sample retained in the core catcher at the bottom of the core.

PHS-1B extruded sediment above the plastic liner into