

# **HARRIS B. STEWART, JR.:**

**Northern Holiday Expedition  
1951**



January 2004



**US Department of Commerce**

**noaa** NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

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Oceanic and Atmospheric Research  
Atlantic Oceanographic and Meteorological Laboratory  
Miami, FL



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M. J. Bello and A. Y. Cantillo

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COVER PHOTO: M/V Horizon in Kodiak, AK (1951).

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# Harris B. Stewart, Jr.: Northern Holiday Expedition 1951

M. J. Bello<sup>◇</sup> and A. Y. Cantillo<sup>△</sup>  
(Editors)

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## Abstract

Intensive exploration of the seas using modern technology began in the 1950s, when the US Navy funded research to increase knowledge about the oceans. Harris B. Stewart, who eventually became the first director of the NOAA Atlantic Oceanographic and Meteorological Laboratory in Miami, FL, joined the 1951 Northern Holiday Expedition of the Scripps Institution of Oceanography when he arrived at the Institute to attend graduate school. The main goal of the expedition was to survey unexplored sections of nautical charts and perform a complete survey of the Mid-Pacific Mountains. Dr. Stewart's papers were donated to NOAA by his family upon his passing in 2000 including the field diaries written during his career. The field diary written during the Northern Holiday Expedition contains descriptions of day-to-day ship activities including the retrieval of a 100-pound manganese nodule and the charting of the Scripps Seamount.

## Preface

Intensive exploration of the seas using modern technology began in the 1950s, when the US Navy funded research to increase knowledge about the oceans (Shor, 1983). Institutions such as Scripps Institution of Oceanography, La Jolla, CA, were on the forefront of such work. During the summer of 1951, scientists from Scripps sailed to the Gulf of Alaska aboard the M/V Horizon on the Northern Holiday Expedition. The scientific leader of the Expedition, Warren S. Wooster, explained that: "A holiday is an old nautical term that designates a piece of work left unfinished." The main goal of the expedition was to survey unexplored sections of nautical charts and perform a complete survey of the Mid-Pacific Mountains. Harris B. Stewart, who eventually became the first director of the NOAA Atlantic Oceanographic and Meteorological Laboratory in Miami, FL, had just arrived in La Jolla to start graduate school at the end of June 1951. Wooster asked him to join the scientific party and Stewart did not hesitate.

One of the highlights of the Expedition was the retrieval of an extremely large manganese nodule weighing over 100 pounds. The nodule came to the surface wrapped in the hydrographic wire. Stewart noted in the scientific log:

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Plate 1. Dredging in the Gulf of Alaska after surveying the Mendocino escarpment in 1951. Left Henry W. Menard, right Harris B. Stewart. [Courtesy of SIO Archives/UCSD. Glossy print, black and white, 8 x 10 in. caljsioa \_mc1871190003 \_m.jpg. H. William Menard Papers, 1938 -1986. Scripps Institution of Oceanography Archives, La Jolla, CA.]

"Great manganese globules measuring as much as 5 inches in diameter were pyramided on the top of the specimen . . . We are restraining ourselves (with difficulty) from breaking off a chunk to see if it is MnO<sub>2</sub> all the way through. It looks as though it might be, but we will preserve it as it came up till older & wiser oceanographers have looked & marveled." (Log book of Northern Holiday Expedition, Geological Data Center, Scripps Institution of Oceanography) (Shor, 1983).

A detailed account by Stewart of the retrieval of the manganese nodule can be found in Kerr Kuhns and Shor (2003) and is reproduced here courtesy of SIO/UCSD. It is interesting to note the similarities of this account with that in the original field diary.

#### The Big Catch

For the first week after Kodiak, the expedition settled down into a routine of station observations, mid-water trawls, continuous measurements of the various parameters that were recorded in the lab, and an occasional dredge or sediment core. Routine, that is, until the night of 10- 11 September.

Somehow the bottle-cast stations for four straight nights had ended up on my watch with Al Smith, Jose [Barandiaran], and Charlie Denkle. That night the other three secured after the deep cast was in, and Bill Riedel came aft to help me take core No. 10. We put the big Phleger corer over in 2750 fm (16,500 feet or just over three miles) of water. The dial in the hydrographic winch reads in meters, so it would take about 5100 meters of wire to reach the bottom if the corer went straight down. That night, however, even with only a light wind, Horizon was apparently drifting fast, for we soon had a wire angle of forty-five degrees. The corer certainly was not going straight down, so it would take more wire to get it to the bottom. We felt we would know when it reached the seafloor, for there was a clever device called a ball-breaker on the cable just above the corer. When the corer enters the bottom, tension on the cable is relieved, and a heavy mass of lead with a sharp point slides down within the ball-breaker to puncture a glass sphere that implodes with a pop that we can hear on the hydrophone that dangles over the side and is connected to a loudspeaker on the after edge of the boat deck. We had the winch operator let out 100 m more, then 200, 300 until we had 6300 m of wire out, and the winch drum was down to the last layer of wire, but still no pop from the ball- breaker. So we had the winch start the long voyage home for the corer.

With about 5900 m still out, the winch ground to a groaning, complaining halt. I climbed up to the boat deck to talk with Don Derringer - now in full beard - who was running the winch. He increased the power, and the drum turned slowly. As the ship rolled to port, the winch stopped. On the starboard roll, there was enough release of tension so a few feet of wire could be recovered. At this slow pace, we figured it would take at least three hours to bring the corer back aboard.

Bill and I did a bit of dip-netting in the light from Mac's floodlight, but dawn was coming, and the squid and sauries were not interested in being caught. Derringer's watch was over, and George Fenton had assumed the winch seat. I was sitting on the hatch cover hypnotized by the regular groans of the winch with each roll and enjoying slightly libidinous thoughts when I was startled by a loud splash sound followed by a heavy dripping sound. I turned and there above where the wire left the water and even with the overside bucket and rising slowly toward the sheave was a great gleaming black mass. It was still dripping as it rose slowly upward. I knew that if it reached the sheave we would be in trouble, so I screamed at George to stop the winch. He did when the "thing" was only inches below the sheave. I jumped into the bucket. At first glance, I thought it was a large turtle. It was round and about the right size. But once in the bucket, I could see that it was an immense rock that somehow had become entangled among the many meters of 5/32nd-inch wire that must have lain on the seafloor. The winch had stopped, and it seemed strangely quiet without the straining whine that changed pitch with every roll. George shouted down, "What is it, Stew?" I was looking at it and still couldn't believe it. Three or four turns of wire in a perfect clove hitch had secured a large manganese concretion. I held my breath for fear it would come loose and drop back into the sea. Who would believe me if I said we had brought up a big rock in the hydrographic

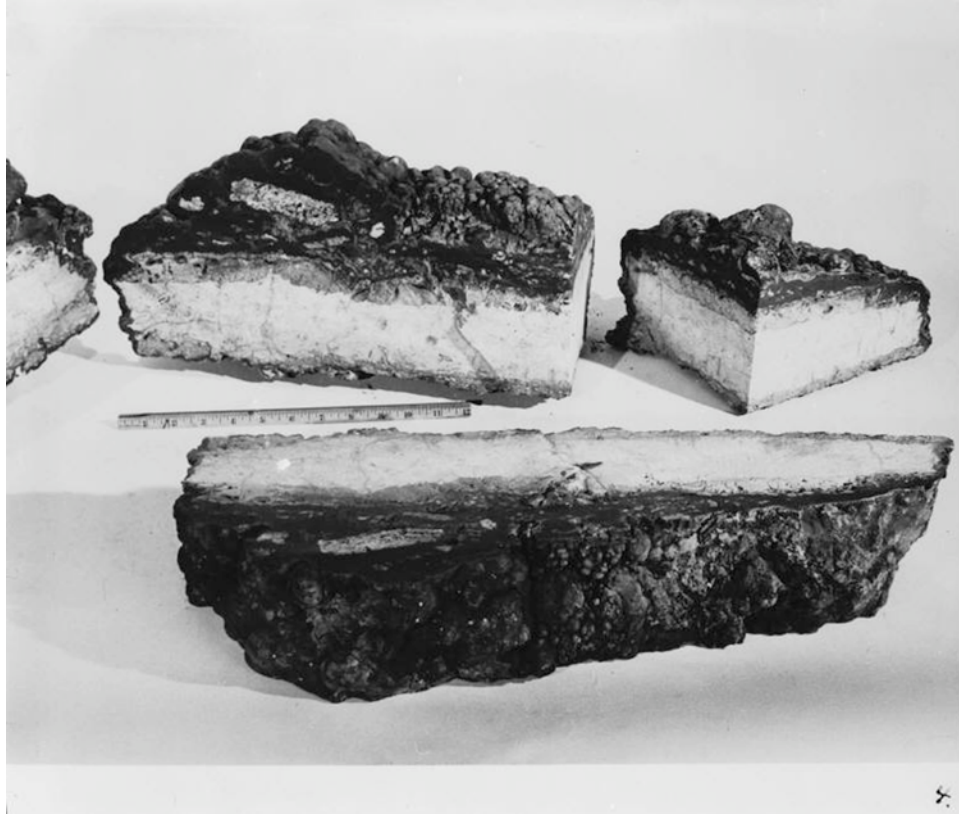


Plate 2. Cross-section of the Stewart manganese nodule, a very large piece of white calcareous ooze, thickly coated with black ferromanganese oxides, cut into three sections to expose the interior. The scale is in inches. Identification of this nodule as the one retrieved during the Northern Holiday Expedition has not been possible but it is probable. [Courtesy of SIO Archives/UCSD. Negative, black and white 4 x 5 in. caljsioa \_mc18850029 \_m.jpg. H. William Menard Papers, 1938 -1986. Scripps Institution of Oceanography Archives, La Jolla, CA.]

wire, but it had dropped off and fallen back overboard? On the Mid-Pac Expedition [1950] scientists had been excited by fist-sized manganese nodules dredged from Sylvania, Hess and Johnson guyots, and here before me dangling on a wire no thicker than a lead pencil was a piece almost three feet across. I shouted for Bill Riedel and he came up into the bucket with me. We decided to have George lower it enough so it could rest on the rim of the bucket. He did, and as the ship rolled, I hung onto the rock as though my life depended on it. Had it gone back to the bottom, I think I still would have been hanging on when it landed.

Bob Haines brought out a wire come-along, hooked it to the wire and to the bucket rail so that it took up all the weight of the outboard part of the wire. George then reversed the winch, and Bill and I carefully - even lovingly - lowered the specimen onto the floor of the bucket and carefully unwrapped the wire that had held it so securely through its three-mile rise to the surface. We felt that without a doubt, it was the finest geological specimen ever recovered from the deep sea. We carried it into the lab, grinning like Cheshire cats. We knew we had a real trophy.

The Horizon nodule, as it is now known, weighed over 100 pounds. It was made up of a manganese oxide crust over a rock called phillipsite and topped with a pile of separate manganese nodules. It is a spectacular specimen and now resides in the museum of the Scripps Institution of Oceanography in La Jolla, California. Scripps Gets a Seamount

Another highlight of the Expedition was the survey of the Scripps Seamount, an 11,400-foot mountain, 18 miles across at the base, standing "in lonely grandeur on the sea floor" in the Gulf of Alaska. Its summit a mile below the surface. Stewart described the discovery of the Scripps Seamount in Kerr Kuhns and Shor (2003) reproduced here courtesy of SIO/UCSD.

In the Gulf of Alaska, Bill Menard and I surveyed ten seamounts, eight before our brief stopover in Kodiak and two more after we left. Three of the ten were new discoveries. These were surveyed in detail and their locations determined. Later, the results of these surveys and the supporting data were turned over to the US Coast and Geodetic Survey (USC&GS) so the seamounts could be shown on the nautical charts for which the USC&GS is responsible. The largest of these new discoveries was found some seven hundred miles northwest of Hawaii, and it was a big one. It was flat-topped and rose 11,400 feet above the seafloor to within 900 fm (5400 ft) of the surface. That's a mountain over two miles high that rose from a base only eighteen miles across. We thought this one was big enough to justify being named Scripps - a designation being saved for a really big one, and this was it! It is now listed in the Gazetteer of Undersea Features, names approved by the US Board on Geographic Names. It is listed as Scripps Guyot at 23° 50' N, 159° 23' E.

#### Diary and transcription

The Stewart family donated the papers of Dr. Stewart to NOAA's Atlantic Oceanographic and Meteorological Laboratory upon his passing on April 25, 2000. Among the Stewart material are 13 field diaries written over several decades, most during the time of great ocean exploration. The diaries will be transcribed and published as a series.

The Northern Holiday Expedition field diary is a bound notebook with a green cover, and measures 5 by 8 inches. Entries were made in ink and pencil, and include sketches of equipment and animals. Unnumbered sections of the diary contain black and white photographs, several of which are missing, and data. Loose material, including cruise instructions, newspaper clippings, notes, letters and a photograph, were found inside the diary.

The diary was transcribed by hand. Minor editorial changes were made as needed. Indecipherable entries are noted with "[xxx]". Editorial comments are noted in brackets and capital letters. Numbers outside the margin of the transcribed text are the page numbers of the original diary. The diary and ancillary material were scanned and the graphics files, in JPG format, are stored in the CD. In some computer systems, an active link to the appropriate graphic file is part of the page numbers found outside the margin of the transcription text.

#### Acknowledgments

The editors wish to thank H. M. Stanford, J. Gray and A. Lorenzo for their comments, and D. Day and the Regents of the University of California for their assistance. The transcription of the diary was funded through grant no. 02-432R from Environmental Services Data and Information Management (ESDIM), NOAA/NESDIS/GeoSpatial Data and Climate Services.

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H. B. Stewart  
M/V Horizon  
Record

[0](#)



Thursday - August 2 -

[1](#)

It is now Thursday Aug. 2<sup>nd</sup>, and we have been at sea since 4:30 Saturday afternoon July 28<sup>th</sup>. This is the first time that I have had simultaneously the time and inclination to start what I hope will be a pretty complete record of this cruise.

The first three days - through Monday night are - so far as I am concerned - better forgotten. It was moderately rough weather, and I was one sick cookie. The nights were spent in hellish wakefulness as I was rolled from one side of my dresser-drawer bunk to the other while my head and feet were ultimately raised and then dropped to be brought up with sickening suddenness. It is only during motion such as those of a ship or plane, sudden changes of direction, that one is made rather uncomfortably to realize that one's body is made of parts of

[2](#)

varying rigidity. The bony parts would start back up as the fleshy parts were still on the way down. Lying on my back, I could feel my innards pressed against my spine, then they would rise as my body started down. It was all damned uncomfortable. Added to that was the noise of the engines - a noise I now am quite used to - and the noise of loose gear that was knocked against steel bulkheads with every roll. To make my misery quite complete, I was thoroughly seasick. From Sunday morning till Tuesday noon I had but one small meal and one apple, all of which I saw a lot sooner than I had planned. There were others in the same boat - so to speak - and we now are all recovered and roll with the ship in the best nautical tradition.

3 Above the murk of misery that comprised those first days, quite a few interesting facts merit a brief note or two.

The ship is the motor vessel (M/V) Horizon, an ATA (Fleet Attack Tug) originally converted, as I understand it, for the Fish and Wildlife Service, but now owned and operated by the Scripps Institution of Oceanography and used solely for oceanographic research. She is 143 feet long, some 6 feet longer than the Littlehobo, and carries a crew of 19 in addition to the six of us in the Scientific Party:

Warren Wooster, Chemical Oceanographer

John Isaacs, Mid-H<sub>2</sub>O Trawl -

H. Willard Menard, Submarine Geologist

Allen Smith, Oceanographer - Hydrographer

José Barandiaran, Peruvian Navy

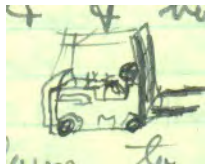
John McFall, S.I.O. [SCRIPPS INSTITUTION OF OCEANOGRAPHY] Photographer

Charles Simmons, Asst. Technician

and H. B. [HARRIS STEWART] -

Jim Eaun is our capt.

4 She is a good ship and pretty well rigged for this type of work, and the open mess (come in the whenever you are hungry) and general casual air are a must welcome contrast to the cold regulation-bound formality of the Mawry and battle ships. This is my first jaunt on a civilian ship, and if nothing else, the freedom from the ever-squawking p.a. systems of the navy with their "now hear this - - -" makes the comparison worthwhile. The crew aboard is a fine crew, mostly ex-navy chiefs and a smattering of youngsters from colleges in vacation.



5 But to start at the beginning: The ship pulled in at the Navy Electronics Laboratory Pier at Point Loma Friday noon - that would be the 27<sup>th</sup> - and I hopped aboard the finger lift and began to take the gear and had been collecting down to the ship. By 4:30 most of it was there and still had to be put aboard, but I quit for the day, as I still had all my own stuff to collect and had to move out of 924 So. Court. My suits are at Tom Parker's, Bill Riedel has my typewriter and books, Jean Pierson my laundry, and my trunk is in the back of XXX [NOT CLEAR]. Sat. A.M. I drove to San Diego to pick up some low canvas sneakers at a surplus store, and then picked up Bill Menard at his place in Pacific Beach. He left his car at Buff's place in Point Loma, and I drove him to the ship, locked and left Mohit in the parking place at N.E.L. and



trust she is OK. The sea air will have raised havoc with her finish, but it will cost less to have the finish cleaned than to have rented a garage for two months, it's like renting your wife to someone. [SECTION CROSSED OUT]

I finished loading our gear, and we shoved off late Saturday afternoon. Had I realized that the good steak dinner in the mess that night was the last meal I would look at with comfort for three days, I would have enjoyed it even more. 6

At one point Sunday while I was bending wire at the vice back aft - wire for the dredge - and swallowing hard to keep from being sick again, I spotted a great cloud of spray that didn't at all look like the spin drift that was being blown from the white caps about us. Even as I watched, a long flat tentacle-like thing rose writhing some 15' above the surface of wave crests, it twisted and writhed and fell back into the water. I shoved it to the others, and as it happened the next time, I got a better look. About two feet broad, white on one side and black on the other with small bumps along the edge, it obviously was the 15-foot flipper of some much larger animal. The cloud of spray that I had seen that the other hadn't made me say whale, while the others were still in the octopus - turtle stage of deduction. A glance at the books kept aft showed that the hump-backed whale reaches 50' in length and has flippers just like this one that are 1/3 as long as it's body. I was set up as an expert right off. We came about and spotted him still cavorting or "lob tailing" as they call it - as a matter of fact we had to go full right rudder to keep from hitting him - a collision that could have done us a good deal of damage. As we neared him, now lying flush with the surface, we could see his skinny back between successive waves, he must have realized that we were a scientific ship and "blew off" just as we changed course to avoid collision and sounded. We rushed to the side as he went beneath us, but couldn't see him again. Striped dolphins with a wartime camouflage-like pattern were with us most of Sunday as we paralleled the coast. Sleek gray and white devils that swam and dove over the crests in nice *en echelon* formations. When one of the crew brought back a flying fish that had been washed aboard, I felt indeed like Kon Tiki. Too, our working area aft was awash all Sunday and Monday with green water coming over the gunnels but I am glad we have engines and not merely the sail and bolsa that somehow carried that crew across to Polynesia. 7  
8

Monday afternoon we stopped very briefly at Frisco. The bridge was in fog as it had been when last I passed under it on my way back from overseas in Feb. of '46.

We stopped to get John Issacs and some leads for the deep cast and I just had time to bob up and get a book for Clare. I had felt badly about not having done any more for her birthday than a telegram. The book on Calif. is not much of a present, but I just didn't know what to send her. We left S. F. late that afternoon, and as soon as the horns of the piers for the Golden Gate bridge were out of earshot, we were at last on our way. 9

There is a darned interesting hole at the entrance to S. F. harbor where it is narrowest. It is like others in similar areas where tides from a large area enter and leave on a constricted channel. There are several between the islands of Japan and a good one at Gibraltar. We got a good trace on the fathogram both in and out.

Since then we have been settling down into the routine of shipboard life and the busy business of oceanographic work. 10

It has been almost constantly rough, though today was most pleasant though still pitchy and rolley. It was as though the sea knew that we were here to wrest her secrets from her and had decided that no man would get her secrets without living intimately with her first, so she took us to her bosom and drenched us all. Oilskins and bare skins were the clothes on all decks and a green water came by the ton over the bow to run the full length of the boat deck sending up geysers of foam at every obstruction to some XXX XXX [NOT CLEAR] into the after working

11 area already under a swirly foot or so of white water . Well we lived with her and survived and are now in business with plankton nets, deep water trawl, bottom dredges, bathythermograph, Nansen bottles, thermitow, fathometer and XXX XXX [NOT CLEAR] (plus my fish line) trying to learn more about the oceans. What their bottoms are like, their chemistry, temperatures of surface and depth, and their vast populations. It's a great business, this oceanography. We are now at the stage in oceanography that the U.S was in when the first expedition began to fight their way west across the prairies, deserts, and mountains. We have meager tools, spotty information, and an unbelievably vast area unexplored. It's a big job ahead and fun to be in on the ground floor.

12 I go on watch in 10 mts - watch being my 4-hr. turn as nursemaid to the recording instruments back in the lab and we are due on station #5 about 3 AM, so I had better fold here temporarily. It is overcast with high strato-cumulus clouds and a light streak in the west where sea and sky meet in what was a fizzled out sunset. The sea is deep gray - leaden color really - and a good swell keeps on a nice roll at the 11 knots we are making. It's cool and damn pleasant.

For the record:

Take the case of the modern squid  
He don't do what his ancestors did.  
A million-year heritage was shot to hell  
When he discarded his age-old shell  
When the shell got heavy and made him sink,  
He took it inside and invented ink.  
So the Reynold's pen is nothing new  
A squid uses ink underwater too.

Notes on Muenen's [NOT CLEAR] Marine Geology:

"Hemipelagic"- a word full of magic  
Is, at least, well define in this missile  
But I find rather tragic the use of "pelagic"  
As meaning the same as "abyssal".

13 August 7th- Tuesday, I think, but the day of the week has no meaning for us at sea, so no one keeps track of it. We know the date for that is marked on all the machines and on our course plot, but Sunday is no different from Wednesday or Saturday. Often someone asks what day it is, and we all feel silly at not knowing and the guesses usually have a 3-day range. All the bathythermograph, G.E.K., thermitow, and wind recorder records are kept in G.C.T. (or Greenwich Civil Time) which is now 9 hrs. ahead of us, and I always feel galled a bit to put down a morning time in the middle of the night sometime. The feeling is one of frustration, I guess. Here I am up at 4 am on a black rolling morning jotting notations on a record, and when the record is worked over later, it will read 1300 and I am getting credit for my lost sleep. By the same token I feel as though I am getting away with something when I mark down 0100 at four in the afternoon. Strange, don't know why I have to get personal about it.

14 It's a nice evening. Now 1930 and the sun is still above the horizon, but not much. I'm in the chow hall again. Chuck and Jack are playing cribbage at the middle table and the sounds of 15-2, 15-4, and a pair is and come dully through to my senses. The sea is calm with a good swell running, and the starboard steel door to the chow hall is hooked outboard, but bangs against the bulkhead at the top of every roll and I can feel the shudder every time it hits. John Isaacs his midwater trawl down to 2100 fm (that's 12600 damn feet- over 2 miles) and the big winch aft is screaming with the strain of bringing it in. The sun is now set, and the western sky is a riot

of color. There is a row of stately anvil topped cumulo-nimbus thunderheads along the western horizon edged in gold. If a strand of altostratus has been dyed deep purple and great spokes of pink radiate out from the spot on the rim where the sun slipped gently into the sea. Looking out the port door I see the horizon line rise past the opening and then sink below it giving me alternate door falls of sea and sky.

I have the 12 to 4 this morning, and if I had any sense I'd go below and get some sleep, but once I have brought this book up and am writing in it, I like to keep going. I feel it is going to be a sparse record, and I want to get as much down on paper as possible before I peter out. [15](#)

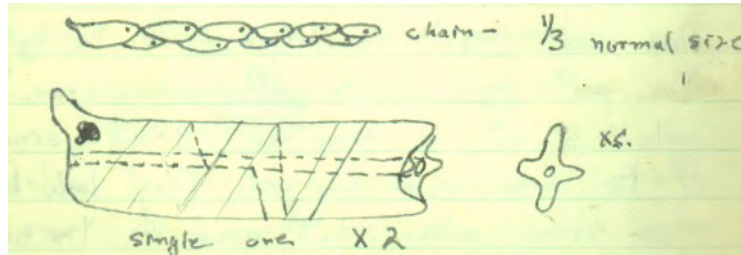
When stations come at night (we are approaching #10 now) we always do a good deal of dip-netting for the marine biologists back at Scripps. Batting along at 11 knots it's hard to believe that the sea is as teeming with life as we find it once we lay to make a station. Two nights ago I was helping Al, who was in the bucket removing Nansen bottles from the deep cast. I would carry them into the lab and place them in the rack. We had one of Mac's photoflood lamps lashed to the rail so it shone down into the water and I suddenly saw two white streaks go through the water about 5' below the surface. We soon identified them as squid - about 18' long and broke out the dip-nets. They had come up to get the amphipods that were scooting along the surface and occasionally the squid in a short fast dart would break the surface and then scoot down again. There were 8 or 10 of them, and they stayed just at the outer edge of the lighted area. Occasionally they would come nearer the ship always wary, but I netted one in the coarse meshed net and dropped him on the deck. He had a pink-silver back that was almost opalescent, and there was something hideous and evil about him as he writhed there on the cold damp steel of the deck in a spreading pool of dark brown ink. His directional fins folded and unfolded around his tail convulsively and his tentacles thrashed the air. To test his grip I placed the edge of my canvas shoe into his head, and he grasped it with his tentacles and dug out the rubber with his single claw-like beak. I instinctively withdrew my foot and he was pulled along with it for a foot or so and then dropped back to the deck with a wet slurp and continued his futile writhings as the colors on his back faded fast. The first one we put in formalin to preserve him, and when one of the crew netted another, we saved him for bait the next day. They travel fast back-end to - the original jets - but can also move forward when they are moving in to something. Last night John caught two, and we put one right back on a hook and left it. Simmons' frantic shouts brought us to the starboard rail near the bucket, and there about 5' below the surface was a big squid - easily 4 feet in body length - with his tentacles around the smaller one and back tracking with his prize. We tried to hook him but couldn't. We could see the big pink shape there below the surface approaching the bait, take it, and then back off, but if we pulled on the line, he let go. Again the big squid would come out of the black, turn and move in fast to grasp the smaller squid in its tentacles. Each of us watching shuddered each time it grasped the bait and were grateful to be only watching the battle going on below us. [16](#)



These waters teem with small saurys [NOT CLEAR] (sp?) and last night on station with the light over the port rail of the after working area, I was able to net as many as 24 at a single sweep of the fine-mesh dip net. They look blue when seen from above; but once in the net, it's clear that they have a blue streak down the middle of their backs and are a bright silver over the rest of their bodies. They ranged in size from 1/4" to about 2" long, and swim with quick darting motions. Some curl into a semicircle and then straighten out only to curl again like a blue worm in its death throes. Siphonophores are also common in these net dips. They seem to float along, and I have yet to find how they locomote. They are completely transparent-looking like globules of clear protoplasm - with one small pigmented arc of dark yellow - probably the gonads. Through each runs a hollow tube or siphon [NOT CLEAR] hence the name. Most of them are colonial - probably tunicates - and chains of 12 or 15 are common, looking like a shining [17](#)

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crystal bracelet when they are brought out of the water. Once in the formalin, you can see that they have broad bands of less transparency circling their bodies in a crisscross pattern.



- [19](#) Too, we netted a few of the only insect that has adapted itself to the sea - small sea spiders. It is amazing the way an apparently barren sea seems to spring to life once you stop the ship at night, put a light over, and do a wee bit of looking.

Today we passed through an area of broad well-defined slicks. They were obviously not wind caused, and it was significant to note that the Thermitow that had recorded a homogenous area of surface temp. all the way from Frisco took marked jogs on the record as we passed through the slicks showing that slick areas have a different surface temperature than non-slick areas. Whether it is cause or effect, I do not know. The Thermitow is actually a thermometer that streams behind the ship at about 25 yds and by means of a unit and rubber-covered cable conveys the temp. to a recording instrument back in the lab. This has a continuous roll of graph paper and a pen that moves horizontally with temp. changes as the paper moves vertically past it. On the paper are recorded dates, times (GCT) course and speed changes and anything else (such as slick areas) that will help in interpreting the information later on.

- [20](#) The "gooney birds" - actually the black-footed albatross - have given us a good deal of enjoyment during the past week. Seldom seen when we are under way, they appear from nowhere once we are on station or towing the mid water trawl at a slow 1-4 knots. They are a uniform dark brown except for some white on their upper tail feathers - obvious only when the feathers are spread as they land - and a small band of white around the base of the bill that is missing in some birds and up to 2" broad in others - it may be a function of their age. Wingspans are up to 6 feet, and with legs and webbed feet tucked under them and tail-feathers streamlined, they make a very graceful bird in flight. An occasional apparently effortless motion of their wings keeps them gliding for some time as they skillfully bank and turn just shimming the waves. They lack the awkward laboring flight of the duck that they closely resemble once they are floating on the surface. At the request of Scripps, we take count at each station of the number around the ship - I think 39 is the record to date - counted by Bill Menard atop the big A-frame. (squid - hunt and trawl about to come in - continued later).

- [21](#) (That net trawl was - so far as we know - the deepest trawl ever made in the sea 2280 fathoms it went down - the haul? - about 3 qt of what looks in the cod-end bucket under the lights out on the fantail like an amorphous mass of black, red, and clear jellies and broken small fish bodies. The red is from the shrimp - mainly euphausiids and some red jellies. The black from the lantern fish, viper fish, and others, and the clear from weird jellies. I will try to describe the trawl and trawl haul when I know more about them and have a jar of the little devils before me.)

But to get back to the "gooney birds":

As soon as the ship is stopped or going slowly enough they glide in gracefully for a pretty silly-looking landing. They pull up sharply just above the water, extend their webbed feet forward at an angle to the surface, spread their tail feathers, and skid on their feet as they loose flying speed. Then settle awkwardly onto the water and collapse their wings by jack knifing them like a carpenter's rule along their backs. Once on the water they can move along at about 3 knots by dog-paddling their feet, and when they want to stay on the water but have to go faster, they extend their wings and flap them just fast enough to lift their bodies off the water and then they "walk" with their feet - silliest looking maneuver I ever did see. Then they collapse their wings and plane along on their bellies. They take great delight in testing for taste every thing that goes over the side from steak bones and milk containers to toilet paper and matches. No gooney bird seems to trust any other gooney bird's judgment, and I have seen as many as ten birds pick up a match in turn and each discards it when he finds it not too tasty. They were coming in close this afternoon. I was perched on the port bits reading a pocket edition of Mailey's The Naked and the Dead soaking up good warm sun, when Bob Haines went by with a whole can full of steak bones and fat, stale bread, and what-not left over from evening chow. I could hear the gooneys off the fantail and climbed up on the other platform to watch. They came right in to the fantail for the food, and how they did scrap for it. Some sadist in the crowd suggested the age-old stunt of trying two pieces to opposite ends of a good length of string and watching the fun. I imagine Homo Neanderthals used to do it with vines, but it sounded like fun to the now-bearded crew that had collected aft to watch the fun, so we did. Two birds swallowed great chunks of meat and indeed seemed surprised to find themselves joined to each other by 4 feet of stout twine. They pulled at each other for a while till one disgorged his end. The other bird though was having trouble. The whole pack had drifted some 100 yds astern following the food and most of the boys went back to their packet books or sunning. Only Mac and I stayed to see how he made out. It didn't seem like fun anymore, and as we watched the poor bird-wings extended-humping along trying to disgorge what was stuck in his throat, we felt ashamed somehow, ever though we hadn't done it.

"Poor devil" I said, and Mac said "Yeah" without turning.

One by one the other birds lift as the food supply dwindled and came "walking" back to the fantail. One bird stayed with the troubled one, and then he too left him and came back looking for more food. The bird was drifting farther and farther astern still humping with wings lying flat on the water. Suddenly he succeeded and took off to glide up toward the ship and the other birds. Mac and I looked at each other and just grinned, we were glad he had made it.

It's 11:00 (oops, 2300) now, and most of the crew has retired. There are a few around that are due for the 2400 watch - reading and brewing coffee. We have speeded up to 11 knots again and are due on station in about 40 minutes. It is a nice night tonight. The moon was up for a while, a fat crescent of gold with a narrow path of golden sequins running from the ship to the horizon beneath the spot where it hung at a crazy angle like a Christmas tree ornament hung by a child and left at the wrong angle where he put it so as not to hurt his feelings. It has since been covered by clouds, but directly above are lots of stars. It is cool and the gentle roll is friendly.

Notes penned after telephoning Reproduction Section at NEL:

Any man at NEL  
Who likes a good seduction  
Smiles when the pretty voice answers the bell  
"Good morning, Reproduction."

CH

Whales are here for corset stays  
For eating, there's the albacore  
If every pet has it's *raison d'etre*  
Then what is the siphonophore?

CH

The sample is ample, but coring is boring.

[25](#) Lines scribbled at 924 So. Coast after tripping over Molly's Honey Bubbles and falling on Alice an Nance's Caruso:

I know Girard Herschel Street  
I know the cheapest place to eat  
I know the church with the highest steeple  
But, alas, I know more cats than people.

Mr. Pickwich and Honey Bubbles  
Are just the start of my feline troubles  
No wonder the population grew so  
With promiscuous cats like Mr. Caruso

Oh, for Dick Whittington in reverse.  
Than rats these cats are even worse  
I think that I'll import some rats  
To do away with these wretched cats.

CH

There is one thing I will bet  
When we catch him in the net  
That the little saury's sorry.

CH

Putty the poor siphonophore  
For you can see right through him  
The lucky fellow has balls of yellow  
But what good are they to him?

[26](#)

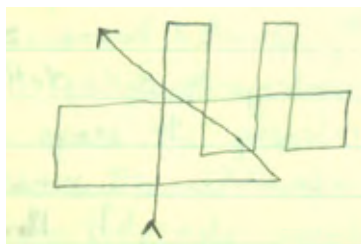
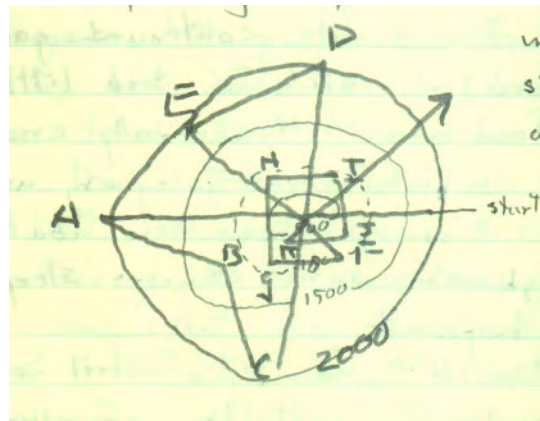
Swim trunks by Jansen  
And bottles by Nansen  
Dredges by Dietz and Menard

August 23rd Thursday

I'd feel guilty if the long hiatus since the last entry were due to more indifference, but quite frankly I have been busy as hell; and when break comes, I am so tired that the rack looms much larger than this record. The first week after that last entry was a rough one from a weather point of view. Sleep was impossible in a bunk that was constantly changing directions with an

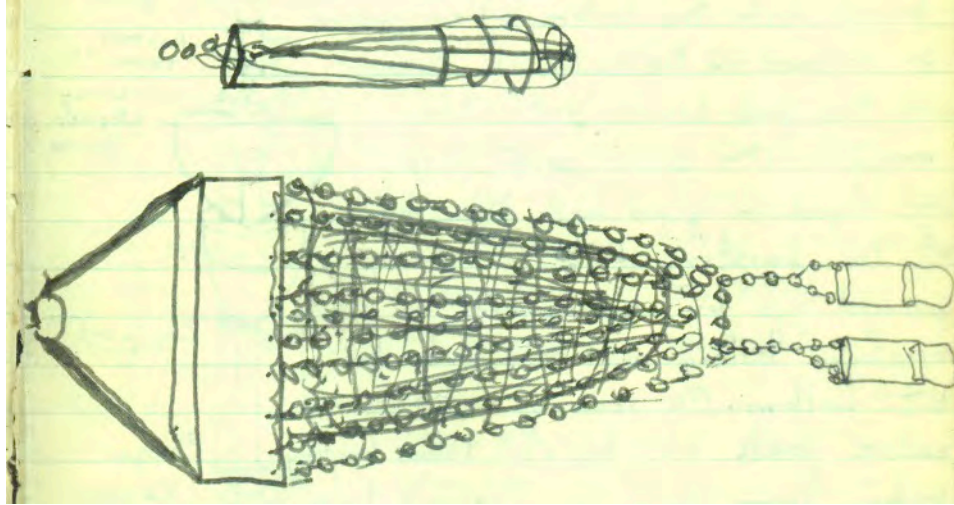
abrupt violence that left you almost breathless. I tried bracing my body crosswise, but it was too hard on my knees and small of my back. Each wave left the ship shuddering, as it shook off gallons of foaming sea. Showers were out of the question, and added to the sleepless tiredness was the physical tiredness of just trying to walk. I moved from handhold to handhold with the short unsure steps of a drunk when he isn't too sure where the ground was going to be when he put his foot down. A trip across the lab could be a mountain climb or a down-hill run depending on when you started. Warren has a game he plays that I have adapted - lean back against the roll, and instead of leaning forward with the roll back, he turns around leans back again, so he is ever leaning backward at about  $\frac{1}{2}$  this angle. The meals continued good, but though not actively sick, I took a little interest in food and felt generally enervated, uninterested in what was going on, and very tired. Since then the seas have abated some, though on some courses sleep is still utterly impossible. [27](#)

About the 16th we hit Gilbert Seamount, Bill Menard I left the regular watch list and the seamount surveys became our babies - those and the dredging. This at first I thought would mean more sleep, - little did I know. We put in 32 hours straight on Gilbert. I took soundings and Bill plotted. 32 hrs in rough seas listening to pings with a reading every minute. When it was over I slept for 21 hours straight. None of the others - Miller, Holiday, Pratt, GA-5, GA-4 "Surregor"- has been so long, but they always start to come in on the fathogram at night. Holiday was a new discovery not recorded before, and it was - fun thrilling really - to watch the trace come in on the fathogram. Like doing a giant double-croctic: We do them on a maneuvering board - actually a large compass rose with 1" divisions and it makes plotting easy. Gilbert we did like this with hydrographic stations at A, C, and D. [28](#)

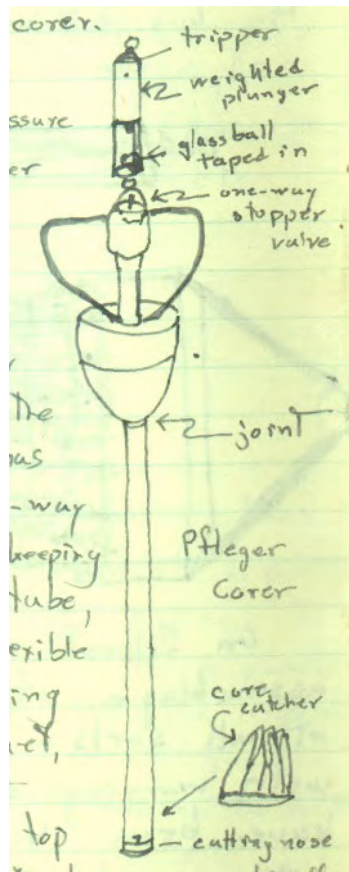


On the others we have varied this pattern to fit what we find. I plotted GA-4, and did it this way. It was a quickie and the long line on  $270^\circ$  gave us a check on the drift.

On each of these we have also dredge. The dredge is a sled frame with a chain bay attached (prevents dumping) and a heavy rope bag inside of that. Behind it are two pipe dredges with canvass bags to catch any fine sediments that may be there. On Gilbert we lost both bags, so I devised a baling wire framework to go around the bag. It worked, and we have done pretty well since. [29](#)



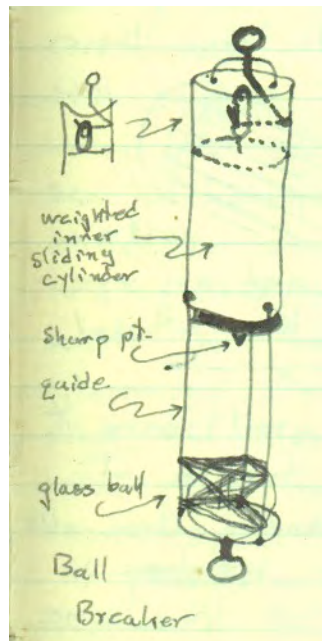
30 On Gilbert we collected an amazing assemblage of igneous and metamorphic Rx [ROCKS] of all sorts - like a Geo 101 lab quiz - with varying degrees of roundness - must have been 400 lbs of it. Some covered with up to 1/2" of manganese. They could only be ice-rafted from further north. Details of other hauls will be listed later, but except for a chunk of bone dredged up last night from Pratt along with the usual assemblage, and some typical volcanic Rx from Miller, they have all been pretty much alike.





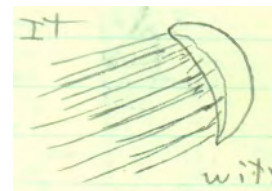
We have also been doing a good bit of coring with the Pflieger corer. A weighted head drives a removable barrel into the bottom. When pressure is released on the cable, the tripper on the ball-breaker lets the weight with sharp point drop on taped-in glass ball. The pop of the bursting ball is clearly picked up by hydrophones on the surface telling us when tube has hit bottom. On reeling in, a one-way valve seats on top of the tube keeping water from running through tube, and care catcher of light flexible copper keeps the core from oozing out. At surface in the bucket, barrel is unscrewed and joint cork is put in top of plastic liner and liner withdrawn vertically so as not to destroy sample.

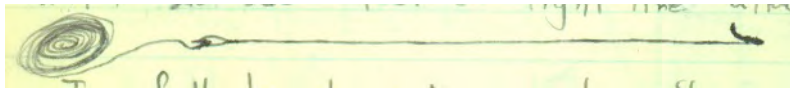
We have gotten some good cores with it, although the one tonight had nothing in the tube. The [31](#) barrel was covered with light blue mud which we saved, but tube was clear. I think the stopper valve must have been stuck, although I loosened it myself before it went down.



The dip-netting while we were on station continued to be good. José Barandiaran, the Peruvian Lt. Cmdr., here as an observer, found a spear somewhere has taken over the spearing department.

The other evening, it was especially good. We were on Gilbert Seamount, I had taken a break from reading soundings while Smith and Simmons were putting Nansen bottles on the Hydrographic wire at one of the stations on the edge of the seamount. The sky was overcast so no stars were visible, and the two spotlights on the mast made the fantail working area a bobbing island of light in a 3 dimensional black sea. Over the port rail we had lashed one of John McFall's photo lights that brilliantly illuminated a half circle of black water below it. We had [32](#) been netting saury's for a while when big jellies began to flout into the pool of light. Tipped at an angle with their streamers before them, they looked like run-away barrage balloons that had taken their mornings along with them. It was José who first thought of the spear - a 4 foot shaft of light steel with an barb at the forward end, and an eye with 20-odd feet of light line attached.





In full beard, with a great mane of unruly black hair and deep furrows of concentration on his brow, standing there with his spear poised for a throw he looked like some modern version of his ancient Peruvian Tiki. The spear made a hiss as it streaked downward through the water trailing a comet-like trail of bubbles behind it, and two segments of torn transparent jelly flouted limply to the surface. Then squids showed up. "Squids", called John Isaacs excitedly as José pulled on the line feverishly to retrieve the spear. Darting experimentally into the outer limits of lighted water were two or three medium sized squid. Each sally brought them closer to the ship. José now had his spear poised waiting for them to get closer. His arm cooked back, fierce he looked, poised and ready, his arm snapped forward and the spear hit the water with a hiss and trail of bubbles. We could see he had missed, a grunted oath and he pulled in for another try. I'd like to be able to say that he speared squid after until he had a great pile of writhing gleaming trashing bodies behind him on the deck, but slave to truth that I am I must note that he didn't get a one- not one damn squid.

33

[AT TOP OF PAGE 33]

There is one thing you can bet  
When we catch him in the net  
That the little Saury's very sorry.

This is a noisy little world I'm living in. When there isn't the throaty throb of the big diesels (sp?) below, there is a moan and whine of the winches, and always the high ping of the fathometer.

34

I can't write in here when it has been so long since I have written Claire, so I will dash off a line to her. I now have two letters to go to her, but want to write at least two more before we hit Kodiak. I'd like to have written her more, but there just hasn't been the time.

Kodiak, Alaska- Aug. 28<sup>th</sup>

We were to have left today, but waited hoping that replacements for the core liners, lost overboard in the storm on the way up, would get here. There was also a new B-T to replace the one with the busted unit, but it too is not here, so we leave tomorrow at 0600 without them.

Land, I must admit, looked good as we made our first land fall early Sunday morning. Off to port under a heavy low-hanging cloud bank, we could see the dark line of land. As we neared the island, the bank of clouds rose like a theater curtain, and before us lay Chiniuk Bay with Woody Island and Kodiak on our right and, ahead and to the left were scattered, apparently

35

haphazardly, the many buildings of the Navy base at the head of Woman's Bay - wishful thinking. The channel is well marked by a long row of buoys, and outside of them, as though to enforce the rules of the road, low patches of dark rock jut above the surface of the water. We now had land on three sides of us, and it was lush and green.

To our right, Woody Island, where a Russian sawmill and a few shacks now fallen to ruin are the only signs of the former Russian occupation of this strategic island at the base of the Aleutian Chain. Just past Woody Island, spread over the wide mouth of a rugged valley, lay the town at Kodiak. In the early morning light, it looked white and clean, a group of neat buildings gathered together for mutual protection from the peaks that towered behind them. Straight

36

green triangular peak crowned with a wide halo of cottony cloudy. Behind it, the jagged peaks of the Devil's Prongs were covered with a clean tablecloth of cloud, while the smaller white dailies were spread neatly over the floors of the surrounding valleys. To the left, past a ragged headland, Woman's Bay stretched back toward the base of a steep green ridge, and farther left in the distance, rose more steep peaks, and there were great patches of snow in the valley heads towards their summits. It was cool and clear and I sucked great lung fulls as I stood up on the bridge and swept the island with the glasses I borrow from Menard.

We turned left and headed into the entrance of Woman's Bay. I mentioned to José that the place [37](#) looked deserted - and indeed it did. It was still some distance away, but we could see movement, hear no sounds to betray that this was any more than the model it appeared to be from seaward. As though to dispel our doubts, a small ship's whaleboat came around the bend in the bay and chugged along the shore, and above the muffled sound of our own engines - now slowed to less than half speed - we could all hear the roar of airplane engines being warmed up, and we saw a truck leading a billowing cloud of dust along the foot of the cliff at the water edge. I remember wandering about the dust because there was a misty light rain blowing into my face.

The well-marked channel lead around a sharp promontory dotted with one story white bldgs., sheds, and ahead of us, at the end of the bay, lay several large hangers with ramps leading [38](#) from water to the large parking area. To the right, a light freighter and floating dry dock were tied up to stubby piers, and we headed towards an empty berth at the fueling pier and prepared to moor behind a navy tug - the type from the which the Horizon was converted. Three sailors sauntered out along the pier to handle lines, and I recall that no two of them were dressed in the same uniform. Heaving lines snaked through the air from ship to pier, somewhere below the enunciators clanged and the Horizon shuddered as the engines were reversed and we nudged the great log floating at the base of the pilings [NOT CLEAR]. Line were made fast, the engines secured and we had arrived.

The water and power lines were put aboard, we got a telephone and a book of base regulations, and changed our clothes in preparation for a trip to town.

Warren Wooster, Al Smith, Bill Menard and I decided to walk part way took a bus stop behind [39](#) the hangers where the yellow bus fills up for Kodiak. The next one left in an hour, so we started to hoof it. We had soon left the base behind, and once over the crest at a low ridge, were in the foothills of the range. The triangular peak that I had seen that morning from the ship rose above us, green and smooth- looking. An eruption at Mt. Katmai (a hundred miles away) in 1912 had blanked the island with volcanic ash and killed off most of the vegetation. The peak was covered with tall grass underbrush. From the narrow road, it looked like soft grass, but it would have been a rough climb though thick brush. It had that same deceptive green smoothness that the hills had around Sentani Lake in New Guinea, hills, that were covered with almost impenetrable [40](#) kunai grass. We crossed a rushing stream on a wooden bridge a stream that looked as though it would be good fishing - and skirted a small lake. Small spruce grew down to the edge of the water where the backdrop at mountains was reflected in the mirror-like water. Occasionally, an ever widening circle of ripples showed where some fish had risen for a fly. It was quiet and peaceful, and the warm sun beat on us and we all were sweating profusely. When a 39 Chevy overtook us and asked if we wanted a ride, we decided to take it. Wed' been at sea 28 days and the unaccustomed exercise was taking its toll, and our legs could tell we had been walking a good deal more than is possible on a 140-foot ship. A man and his wife had been fishing and the 4 big salmon on newspaper on the back seat had been caught in only 2 hours. We made small talk and I peered through the dirty windows at the rugged beauty of the country gliding past. Past [41](#) another lake, around a sharp spur at the mountain where the road bed had been cut into a hard cherty formation, and down a long grade into Kodiak.

42 What had looked neat clean from the sea turned out to be messy and indeed far from clean. Main St. in Kodiak is a group of tired looking frame buildings leaning against each other for mutual support. Two drug stores, one so-called hotel, a general supplies stores, barber shop - a stucco bank, grocery store, 2 restaurants, and 12 bars. One block west is the bay, and behind the stores and bars in the other direction clusters of shabby houses are joined by unpaved rutted streets. There is a sharp jog in the main street and it continuous on to the cannery on an arm of the bay. Here was more, what I had expected to be like. The cannery was built out over the water on pilings, nets were hung cut to dry, and 8 or 10 small fishing boats bobbed at the side of the pier. A rusty winch complained bitterly as a half-breed turned the handle that raised a great net of fish from the bowels of a boat below. The catch was deposited in a big wheeled bucket which he pushed into the clap boarded building that housed the cannery.

We wandered back to the center of town, picked out the Casino as the best bar, and went in. It was dark, and we waited and still our eyes got accustomed to the gloom. Seated around a table in the corner with our 2nd beers in front of us, we felt at peace with the world and conversation came easily.

43 It seemed awfully bright as we came out, and headed down the streets toward the bus stop. One brief stop in one of the few shops in town was enough to show us that there was nothing in Kodiak that we really needed - just junk jewelry, head scarves block printed in colors too gaudy and with Alaska in big letters across it. In the back were two peep machines with photographs on the outside of full breasted nudes and a sign saying that for 25¢ you could watch a movie of a day in a nudist camp.

I'm glad we had the walk in because you could see nothing from the disheveled bus that bumped us back disgorged us and a handful of sailors, at the terminal on the base.

44 Wrote a long letter to Clare that night while the others - well, some of them, went over to the officers club. On returning to the ship, I found that Bill Reidle, Charlie Denkle, Bob Wisner, John Cochrane had come in by plane and I had four letters and two I think cards (to be opened the 19th) from Clare, plus clippings et al., and The Sea Around Us from the book store in La Jolla thanks to J. Peirson.

Unless your stomach was borrowed from Tarzan, limit your claming to months that an R's in [NOT CLEAR].

Tonight we all rocking  
In the cradle of the deep  
But the rocking is too violent  
For anyone to sleep  
I think the cradle's broken  
And just to make it worse  
Tonight it's being rocked  
By a very drunken nurse

I hate to be making platitudes  
But I like warmer latitudes

45 Done in reply to Tom Costain's poem on Lascivious carriage last June.

[PASSAGES CROSSED OUT]

So this long when I am finished  
From the world should not behind  
I will keep the sex diminished  
Won't trap myself as Boswell did.

Lives of great men all remind us  
As their pages we or'turn  
That we shouldn't leave behind us  
Journal that we ought to burn

Lusty thoughts will not be scriven  
My libido I will restrain  
Licentious thoughts from mind are driven  
This log will virgin pure remain.

" Listen Bub", a voice is saying  
"To keep it pure is dumb as hell  
" you write of coring not of laying  
and brother it will never sell"

Wednesday Sept 12<sup>th</sup>

[47](#)

The deep cast is coming in on Sta #50, and since the other section has this station I am back in the lab heckling. Bob Wisner plans a 16-hr net trawl, so even though it is 1900 and we have the next station (Al, José, Denkle, and I) it will be quite a while, plenty of time for sleep, and I want to get this caught up. I've written XXX [NOT CLEAR] and the clan so with some time at my disposal and a clear conscience I taken pen in hand.

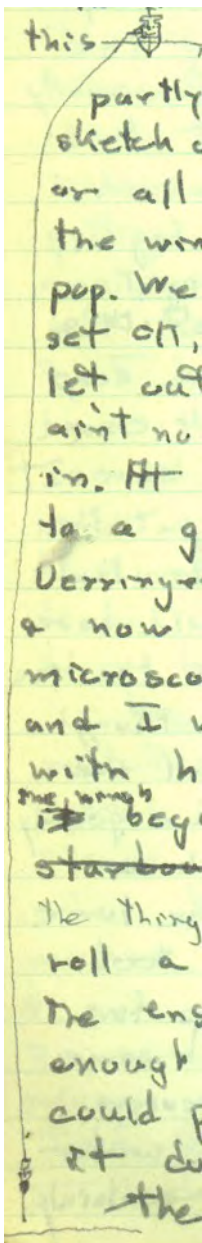
It has been up until the last couple of days a dark, rainy, and generally rough seas sort of a trip. We picked up one new seamount on Sept. 5th that I surveyed, but until yesterday it was pretty routine stuff.

No new BT's waiting for us in Kodiak, so we waited a day for them all to no avail. Warren wanted some more reagents and we needed more core liners for the Pflieger corer to replace the ones washed overboard on the first leg. None arrived, so we have secured the BT - winch (use it occasionally for fishing only) and take BT-s only with SIB 5-13 at 137 m on the shallow casts. I guess Warren Wooster and Charlie Denkle are getting along in their oxygen phosphate analyses without the extra reagents, but Willie Weedle (Tenunda, South Australia) and I have had the skimp on the core liners. We've made one 2-foot core, and several regular length (6') but now have only two liners yet. We may have to extrude them from one liner into bottles on successive tries, but we will scrape along.

[48](#)

We've divided the scientific watches into watches, each of which makes the station and then stands all watches till the next one when the other crew takes over. It makes a much better arrangement and you don't have to loose quite so much sleep. For some weird reason - perhaps we were had - Al Smith, José Barandiaran, Charlie Denkle and I had only night watches for the first 8 or 10 days out. I never did get quite used to staying up all night and sleeping during the day. We still get them occasionally at night, and for our last two stations it hasn't even rained.

[49](#)



50

51

52

Yesterday though things began to pop. We had again the night station the night of the 10<sup>th</sup> - 11<sup>th</sup> and Al and José secured after the deep cast was in and Willie Weedle came on deck to help with the core. It was to be core #10. We put the rig over in 2750 fm of water, that is three miles down - would have taken about 5100 meters had the line gone straight down, but even though there was a very mild swell and wind was light, we had a goodly drift that managed to work up a 45° wire angle by the time 5100 meters of wire was out, so we took her on down to make up for the big wire angle. I wish some one would work out or discover what a wire suspended in water does as the ship drifts. It certainly doesn't stay at 45° all the way to the bottom. I suspect it is a rather like this [SEE SKETCH] but that is mostly guess work partly and because I wanted to draw the sketch anyway. We let out finally 6300 m or all but the last layer of turns on the winch drum, and still the ball didn't pop. We had a hydrophone over volume set on, but no bloody pop. We couldn't let out more wire because "there ain't no more" so we started to haul it in. At about 5900 m the winch ground to a groaning complaining halt.

Don Derringer was winch man - full beard now waxing the much-fingered almost microscopically small tips of his mustache and I went up to the boat deck to check with him. He goosed up the power and the winch began to turn slowly, each roll to port put enough strain on the thing to stop the winch. On the starboard roll a foot or so would come up, then the ensuing part roll would loosen enough so that the next roll back we could pull a bit more in. We had seen it do this before and knew it was the way a winch reacted when it was pulling a deep core out of the bottom, so our hopes rose. It is a three-hour job at least - or should be if your wire has as many splices as this has - to bring a core up from over three miles, so we settled down to some semi serious dip netting and spearing.

There were a few large sauries that broke water occasionally in short jumps as they streaked around under the light. I saw one flying fish, and a few 3 foot white-bellied devils just out of the range of good vision. Then the squids came up - probably after sauries or copepods - and I missed 8 or 10 goods ones with the spear. It was then early in the morning,

Derringer had given way to Fenton on the winch, pitch black night and given way to the first faint shuttle shadings at dawn and my thoughts on fishing had given way to very happy if slightly libidinous thought of Clare when I was startled by a splash followed by great dripping noises. I turned and there

where the wire left the water and rose past the bucked to the sheave, a great gleaming black mass clung to the wire and was still dripping as it rose slowly upward twisting lazily about the wire. I screamed at George to stop the \*@!\$%# winch and jumped into the bucket.

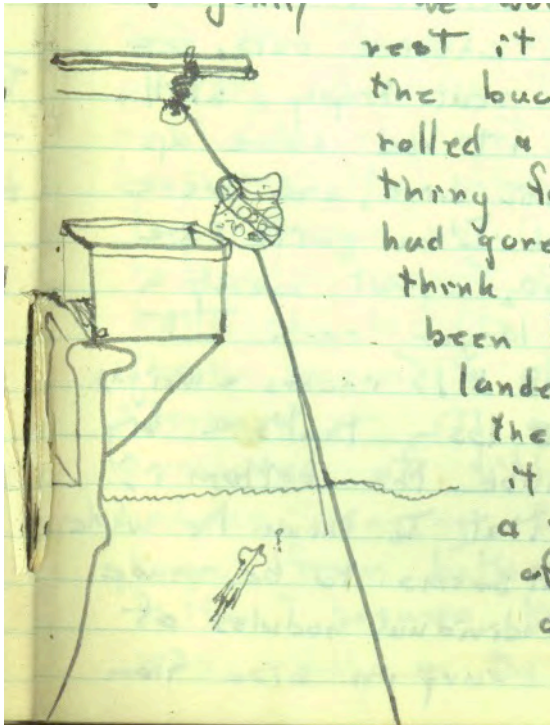
What I had at first fleeting glimpse thought to be turtle, I now saw was an immense rock that had somehow become fouled in the 5/32" wire we use for hydrographic wire and hauled all the way to the surface. The winch had stopped, and it seemed quiet without the usual straining whine that changes pitch with every roll, and I could hear the dripping as water still drained from "the thing".

George shouted down "What the hell is it, Stew?"

I was looking at it and still couldn't believe it. Three or four turns of wire were wrapped around it, and I held my breath for fear it would come loose and drop back into the water - who would

believe it when I told them that "we had brought up a big rock on the hydrographic wire, but it - uh - came off and fell back into the sea.

I knew at once it was a real find and could now see that it was at least coated on top with  $MnO_2$  [53](#) - manganese dioxide- a typical encrustation often found on rocks dredged from the ocean floor. Mid Pac [MID PACIFIC] got some nice nodules from Sylvania, Hess, and Johnson guyots, and they were ecstatic over specimens as big as your fist and here before me dangling on wire no thicker than a lead pencil was a piece almost 3 feet across. I shouted for Willie Weedle he came up into the bucket. We decided to have George raise it gently and we would pull it over and rest it on the edge of the bucket. Then the ship rolled and I hung on to that thing for dear life. If it had gone to the bottom, I think I would still have been hanging on when it landed. [54](#)



Bob Haines brought the wire comealong, hooked it to the bucket rail and took enough strain off the outboard part of the wire that we were able to un-wrap the specimen, and Bill and I lowered it gently - even lovingly - to the floor of the bucket. It is without a doubt the finest geological specimen ever brought up from the ocean floor - certainly the biggest from that depth. It is the sort of specimen that should be placed on the pedestal in a museum somewhere with a brass plate identifying it and a velvet guard rail on highly polished brass post to keep people from touching it.

We carried it into the lab, grinning like Cheshire cats, we knew it was a real trophy, still couldn't believe it had come up in the hydrographic wire, and were justifiably [55](#) excited I'm quite sure it is pure  $MnO_2$  - not merely a coating on a large rock. It measures 25 x 18 x 15 inches and weighs we estimated 120 lbs - that's a big hunk. It is because the bottom is all manganese that I think the whole

thing is pure. It seems to be made up of many individual nodules of  $MnO_2$  that vary in size from pea to baseball size - the largest just over 3" in diameter. Possibly each nodule has something as a starter for collection at its core. It is strange that  $MnO_2$  collects this way. There is not even a trace of Mn to be found in sea water samples, yet these nodules are found. Possibly it is collected by organisms as Pb by some snails as and vanadium by some tunicates, but I rather doubt it. I think it is probably to the "gun barrel"  $FeO_2$  concretions found in the Cretaceous sands of SE New Jersey. Why all the Mn for probably hundreds of cubic miles should rush to one spot to be participated beats me. An interesting problem, though, the "Horizon nodule" has another interesting aspect that may be a hint as to its method of formulation. There seem to be three distinct "terraces" on it and each composed of different sized nodules, ranging from small to large from bottom to top. I say "bottom" because that side of it was muddy a the "top" free from mud and obviously the area of longest accumulation of  $MnO_2$ . [56](#)

Sept. 21<sup>st</sup> Friday

It is now 1330 I am up on the boat deck propped up against the quarter-inch winch in the hot sun. We are now in + 9 time zone I think of Clare as getting ready to make the train to Lakeville for the weekend.

Time seems to move right along we left Sta #63 this morning - that leaves only #65 for our section. I have been using what spare time I have found to get caught up on my charts. Getting positions and courses made quo from the chart house, putting them on the position plotting sheets I brought along then putting in all our soundings come every 10 minutes - oftener when there is some thing of interest- it makes a lot of plotting to do. I'm up to station #52 so should finish OK -

[57](#) But to continue where I left off last week:

The shape of the nodules making up the muss of each "terrace" is different - getting larger more separate with each successive lager The method of accretion suggested by this terracing in this:

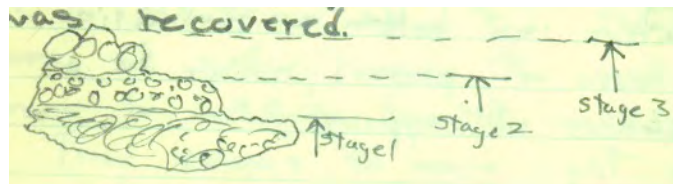
First Stage: Collection of MnO<sub>2</sub> in one location on bottom formulation of base of present nodule to a thickness of approx. 3"

Between the first second stages the nodule was covered with sediment to the extent of the present exposed portions if this first "terrace" while more MnO<sub>2</sub> continued to accumulate on the uncovered portion.

Second Stage: Collection of MnO<sub>2</sub> on exposed portion to a thickness of 6' more (or total of 9" now).

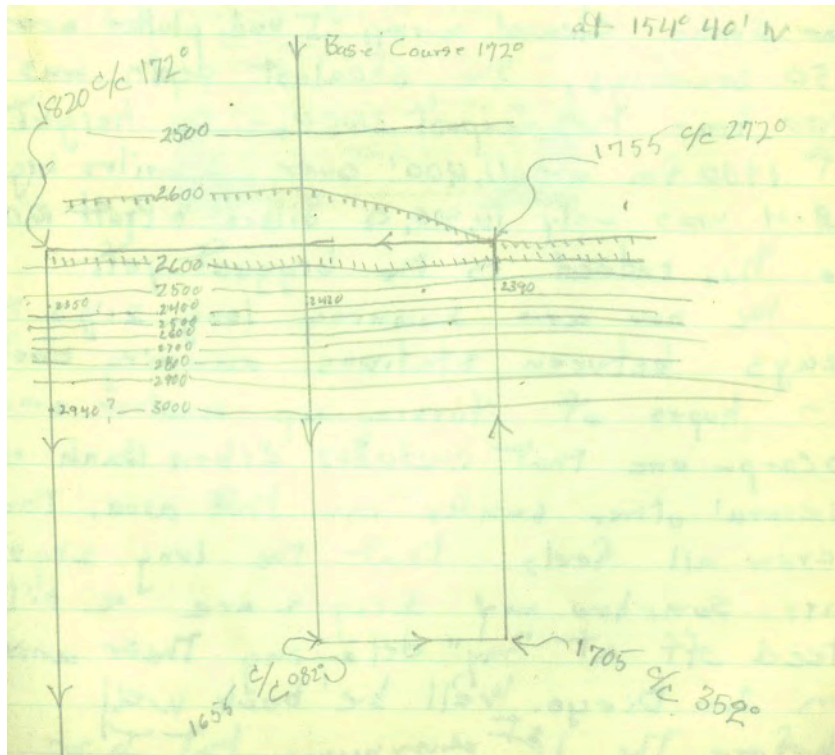
[58](#) Again sediment covered more of the nodule covered part of stage two - leaving an even smaller area of bare MnO<sub>2</sub> to attract farther deposits.

Stage three: Accumulation of more MnO<sub>2</sub> on top of exposed portion of stage two formulation of the largest nodules. This for an additional 6 and' the stage at which the specimen was recovered.



[59](#) By the time it was aboard and the care up- a good one but anticlimactic- it was them 6 in the morning. Reidle went bellow for some sleep I stayed up as the watch until about 0800. The curious flocked back to see it, and even though I was relieved at the watch, I stuck around to ward off souvenir hunters everyone wanted a piece of it. Hit the hay about 11 AM dead tired was awaked about 3:30 to come back and see what was happening to the bottom. I then ran a 3 hr survey (100 snds) of what I am quite sure is the west ward extension of the Mendocino Escarpment. It shoaled to 2420 fm and then dropped off to 3000 ft in a few minutes- that is over 3000 ft and is very similar to the scarp further. This extends the scarp westward to 1500 miles, but is same 73 mile south of the depth recorded by the USS Caimar as sent to Menard by Bob Dietz on his trip to Hydro on route to Europe. The contours look like this:





60

29° 35' N. 147° 42' W

Then the night of Sept. 18th and 19th I celebrated my 29th birthday by bringing in the biggest seamount of the trip. This may be one they have been saving the name Scripps for. I had the watch and it started coming in on the fathometer at 9:30 the night of the 18th. I was still plotting at Midnight when José came to relieve me and I plotted right on - with him calling off soundings - until 4:40 the morning of the 19th. As the smoke cleared away, I had plotted over 350 soundings, the shoalest depth was 900 fm - the deepest 2800, - a height of 1900 fm or 11,400' over 2 miles high. SA-4 was only 10,500 and Gilbert and Pratt 10.080 so this indeed is the biggest yet.

We now are running long zigs and zags between stations running East in hopes of turning up another small scarp - one that includes Erben Bank and several other bank in that area. The crew all feels that the long zigs are somehow my doing and are a bit teed off at "my" delaying their arrival in San Diego. We'll be back well before the 1st anyway but I am getting a little tired of some of their cracks - all done good naturally, but getting monotonous for me. Gosh knows, I want to get back as much as any and I am sure more than most.

61

## 11,400-Foot Peak Discovered in Pacific

LA JOLLA, Sept. 27 (AP)—Two seafaring scientists have discovered an 11,400-foot mountain rising from the floor of the Pacific Ocean. They believe it is the largest known seamount, as undersea peaks are called.

Its top is about a mile beneath sealanes 700 miles northwest of Hawaii and it is 18 miles across at the widest point of the base, the scientists said. They expressed surprise that it has not been discovered before.

Photographic Section

[PHOTOGRAPHS WERE ATTACHED TO THE BACK SECTION OF THE DIARY. PAGES WERE NOT NUMBERED. MANY PHOTOGRAPHS ARE MISSING.]

[1](#)



A rough weekend and then Frisco July 30th



Al Smith, Bill Menard, Chuck Simmons, Warren Wooster and José

2

[MISSING PHOTOGRAPH]

Up to 40° North we caught squid almost nightly in the dip nets



Jack Lucas and the biggest one we caught

3



Water on rough days was constantly sloshing back and forth across the deck in the after working area. That can was beaten to a pulp in 12 hours.



Accumulator and Dynamometer for big winch, dredge and "that can"

A large Frigate bird that circle the ship several times and then came to rest on the wire that ran from the top of the A-frame to the mast. He sat there for several hours and then move on. He gets his name from his habit of swooping in on other birds, scaring them into disgorging their lunch, and then grabbing it on the wing.



[4](#)



5



H.B., the sea and one black-footed albatross.



We had lots of really beautiful sunsets. There was a goodly sea running this time too.



Menard, Wooster, Simmons, and McFall

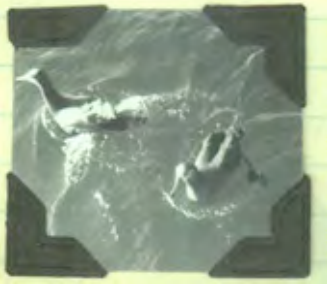


Menard - José Barandiaran- and Simmons. In nice weather, the fantail was our patio

[Z](#)







Even if none were in sight when we hove to on station, there was almost always a whole hungry mob of black-footed albatross hovering around the stern before we left. They were as tame as Central Park ducks.

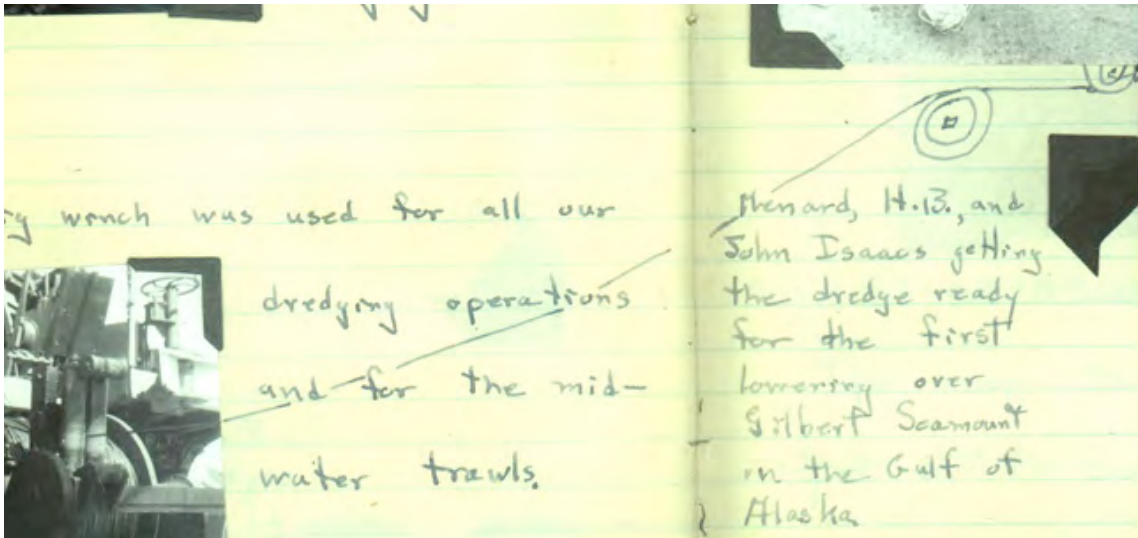
[8](#)



A-frame with the big sheave in the lowered position used for stowage and for dredging.



The big winch was used for all our dredging operations and for the mid-water trawls.



[\[DIAGRAM OF WINCH WIRE STARTS AT THE PHOTOGRAPH OF THE WINCH AND EXTENDS TO THE FOLLOWING PAGE.\]](#)

9



Modification of pipes dredges developed to keep the sample bags from being pulled off on the bottom.

[MISSING PHOTOGRAPH]

Menard, H.B. and John Issacs getting the dredge ready for the first lowering over Gilbert Seamount in the Gulf of Alaska

[MISSING PHOTOGRAPH]

[10](#)

Menard and John Mc Fall

Gilbert Seamount gave up the biggest haul of the trip.



[11](#)

Menard and Isaacs look over the first haul.

They are mostly igneous stuff - looked like a freshman mineralogy lab. Quiz. Undoubtedly they were ice-rafted boulders and cobbles from farther north.

[MISSING PHOTOGRAPH]

[12](#)

Simmons and John ease the mid-water trawl over the stern. That's an extra vane and net to the right. Before we got back, rough seas had collapsed two vanes and claimed one net.

[13](#)



Lucas, "Nick" Carter and John with the net going over for another crack at the deeps. This was a deep trawl, and netted a good haul.

[14](#)



Coming up!



A good catch. The bucket is secured at the end of the net, and the great amount of water going through ruins lots of good specimens.



[15](#)

Menard look over the catch, while John plucks Mictophets (sp.?) out of the mesh



Another new one!

[16](#)



Kodiak Island. Our first glimpse of land in 24 days.



The Horizon moored at the fueling dock in Woman's Bay, Kodiak.



Cannery Dock at Kodiak

[17](#)



Fishing boats docked on the strait between Kodiak and Woody Island

[18](#)



Nets drying and oceanographers sight-seeing at the Cannery pier





A motley crew of thugs and the west half of town



Moonlight on Woman's Bay (well it looks like moonlights )

[19](#)



The Horizon again and the big slide area at the head of Woman's Bay. The Devils Prongs in the distance

[20](#)



Getting the ball breaker and coring device ready for a lowering.



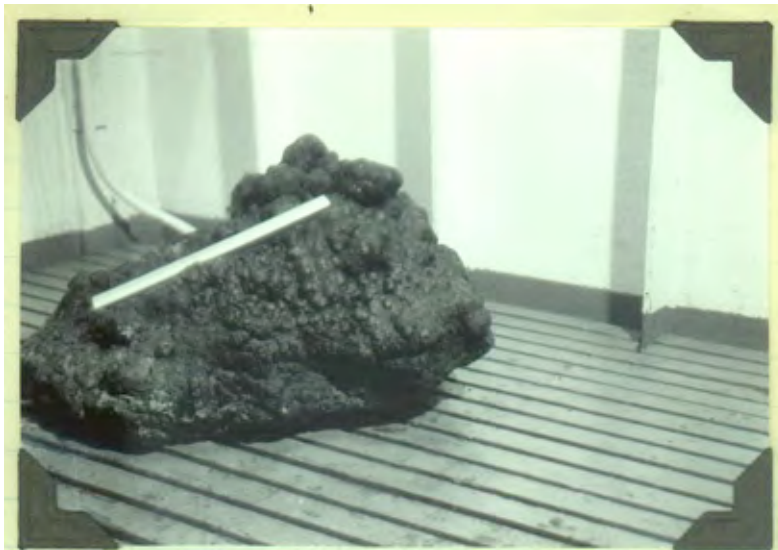
Ball and braker and Pflager Cover ready for lowering.

[22](#)



The wire that gave us so much trouble. We used this winch for shallow and deep hydrographic cast and for coring. We put out 6300 meters (that's 20,500 ft. or almost 4 miles!) the night we brought up the nodule. That made 400 m just lying on the bottom as a snare for nodules.

[23](#)



(12" ruler)  
The Horizon Nodule in the Lab



I just had to put that geology hammer in the picture.

24



José (Commandante in Peruvian navy) getting period and heights of waves



The meter-wheel has just been freed, and the plankton net for quantitative samples is just been tossed over. Net is towed at 30-50 RPM - enough to keep wire angle as close to 45° as possible.

25



Taking wire angle with the hand inclinometer during a plankton net tow.



Up and down



Al Smith putting Nansen Bottle on the line for a deep cast.

26



Bottle rack in lab where temps were read and samples drawn.

27



- and taking it off when the cast came up.





Warren Wooster happily titrating oxygens.



These shots were taken on a fairly rough day. Charlie Dinkle hangs on for dear life, while Al tries to get out of the bucket. We were in the middle of a good roll.

29

[MISSING PHOTOGRAPH]

First it rolls to port and -

[MISSING PHOTOGRAPH]

Then it rolls to starboard. It's Bob Misner on the other camera



Data Section

[FOUR PAGES OF DATA AND CALCULATIONS WERE FOUND AT THE BACK OF THE DIARY. PAGES WERE NOT NUMBERED.]

13 Sept - 3000 - 3470 = 530 fm = 3,180?? 1  
(not surveyed)

Log #4 pp 3 - 4

Seamount Survey (Proposed Scripps Smt [SEAMOUNT])

18 - 19 Sept - 2180 - 0440 (19<sup>th</sup>) = 7 hrs - 10 mts

350 Soundings - Shoalest 900 fm  
Bottom 2800 fm

Log #4 pp 25- 40 1900 fm  
11,400 ft

Summary for Warren Wooster's report: 2

16 - 17 Aug. - Gilbert Smt - @ Sta. #22

16<sup>th</sup> @ 1508 to 0640 on Aug. 17<sup>th</sup> = 15<sup>1</sup>/<sub>2</sub> hrs

550 soundings - Shoalest depth - 620 fm  
Bottom depth - 2300 fm

Log #1, pp 67 - 90 Height - 1680 fm  
or 10,080 feet

18 - 19 Aug. - Miller Smt -

18<sup>th</sup> @ 1900 to 2150 19 Aug = 26 hrs + 50 mts

425 soundings - Shoalest depth - 520 fm  
Bottom depth - 2200

Log #2, pp 2 - 43 Height - 1680 fm  
or 10,080 ft

SEK [NOT CLEAR] Survey - 19<sup>th</sup> @ 2300 and 20<sup>th</sup> @ 0950  
26 jogs - in 12 hrs -

Holiday Seamount

21 Aug 0830 - 1230 - 4 hrs - 150 sndgs

Shoalest depth - 1080  
Log #2 pp 46 - 51 Bottom depth - 2100  
Height - 1020 fm  
or 6120 ft

21 Aug. SA-5 Seamount 3

1730 to 2140 = 4 hrs and 10 mts

250 soundings - Shoalest = 420 fm  
Bottom = 2000 fm

Log #2 pp 52 - 62 Height = 1580 fm  
or 9,480 feet

22 Aug. Pratt Seamount

0130 - 1100 = 9<sup>1</sup>/<sub>2</sub> hrs - 475 soundings

	Shoalest =	390 fm
	Bottom =	<u>2000 fm</u>
Log #2 pp 63 - 84	Height =	1610 fm
	or	<u>9,660 feet</u>

23 Aug. SA-4 - 0820 - 1230 = 4 hr - 10 mts -

175 soundings -	Shoalest =	238 fm
Log #2 pp 88 - 96	Bottom =	<u>2000 fm</u>
Log #3 p 1	Height =	1762 fm
	or	<u>10,572 feet</u>

24 Aug. SA-3 000 - 0900 = 9 hrs

250 soundings -	Shoalest =	410 fm
	Bottom =	<u>2100 fm</u>
Log #3 pp 3 - 12	Height =	1690 fm
	or	<u>10,140 feet</u>

4 25 Aug. SA-1 Sruvey 1250 - 2200 = 9 hr - 50 mts

soundings -	Shoalest =	1130 fm
	Bottom =	<u>2600 fm</u>
Log #3 pp 18 - 31	Height =	1470 fm
	or	<u>8820 feet</u>

5 Sept. Seamount (on potting chart)

0520 - 1130 = 8 hr & 20 mts = 100 soundings

Log #3 pp 60 - 64	Shoalest =	2080 fm
	Bottom =	<u>2700 fm</u>
	Height =	62 fm
	or	<u>3720 feet</u>

Log #3 pp 70 - 71 2000 - 2040 = 40 mts 7 Sept

(not surveyed) 2800 - 2450 =	350 fm
	<u>2100 feet</u>

Log #3 p 72 8 Sept

0100 - 2880 - 2250 = 630 fm	
(not surveyed)	<u>3780 feet</u>

Log #3 pp 75 - 76 - 8 Sept 2156 - 2230

2800 - 2590 =	210 fm
(not surveyed)	<u>1260 feet</u>

interesting trough defines it.

Mendocino Scar Extension Survey - 11 Sept  
1620 - 2000 = 3 hr 40 mts - 100 soundings

Log #3 pp 90 - 95      Shoalest =      2420 tm  
                                 Bottom =      3000 fm  
                                 Height =      580 fm  
                                 or              3480 feet



[MISCELLANEOUS DOCUMENTS FOUND LOOSE IN THE DIARY.]

[LINK](#)

## Life Discovered 6 Miles Down in the Pacific; Anemones, Bivalves and Crustaceans Found

July 27, 1951 Friday  
Times

**SPECIAL TO THE NEW YORK TIMES.**  
MANILA, July 25—A group of international oceanographers and marine scientists exploring the Mindanao Deep off Mindanao Island reported today finding proof that life exists more than six miles beneath the surface of the sea where hydrostatic pressures exceed 15,000 pounds a square inch.

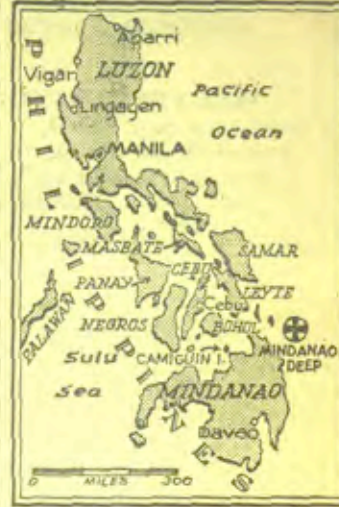
Ingenious scoops and steel nets lowered by cable from the Danish research vessel Galathea first brought from the sea floor samples of primeval ooze containing bacterial matter from 34,000 feet, just under six miles.

Then, exploring at greater depths in the so-called Mindanao Trench, they trawled seventeen sea anemones, sixty-one sea cucumbers, two bivalves and one crustacean, demonstrating the fairly rich variety of life in the previously unexplored submarine region believed to be the deepest spot in the world's oceans—between six and seven miles below the surface.

The 1,600-ton corvette Galathea, borrowed from the Danish navy and fitted for oceanographic research, docked briefly today at Cebu in the central Philippines for refueling and to report on its findings.

The head of the expedition, Dr. Anton Bruun of Copenhagen University, said that the expedition's work and especially its recent findings would help solve mysteries locked prehistorically under the world's deepest waters.

Members of the expedition include Danish zoologists, a marine



The New York Times July 27, 1951

Where ocean life has been found six miles down (cross).

research expert from Thailand, a Swedish scientist and two Americans. The latter are Miss Grace Pickering of Yale University, who is leaving the expedition in the Philippines, having traveled with it from Europe, and Dr. Claude Zobell, science professor from Scripps Institute of Zoology at La Jolla, Calif., who joined the party here. The Galathea is on a two-year circumnavigation trip sponsored by Prince Axel of Denmark.

## RESEARCH VOYAGE SLATED

### Dartmouth Schooner on Project of Undersea Warfare

HANOVER, N. H., Sept. 27 (AP)—Dartmouth College announced today a new scientific mission for its 100-foot schooner, Blue Dolphin, recently returned from a three-month oceanographic survey off Labrador.

The craft will sail out of Boothbay Harbor, Me., tomorrow on the first leg of a journey that will take her off New York. Captained by Comdr. David C. Nutt, U. S. N. R., Dartmouth Arctic specialist, the craft will sail to the Woods Hole (Mass.) Oceanographic Institute for a thorough overhauling.

Later she will be used in an undersea warfare project to be conducted for the Office of Naval Research by Columbia University scientists.

[LINK](#)

AMFORD ADVOCATE, THURSDAY

## Record Seamount Found In Pacific

La Jolla, Calif., Sept. 27. (AP)—Two seafaring scientists have discovered an 11,400-foot mountain rising from the floor of the Pacific Ocean. They believe it is the largest known seamount, as undersea peaks are called.

Its top is about a mile beneath seaplanes 700 miles northeast of Hawaii and it is 18 miles across at the widest point of the base, the scientists said. They expressed surprise that it has not been noted before.

Warren S. Wooster, assistant oceanographer of the Scripps Institute of Oceanography, and Dr. Henry W. Menard, of the U. S. Navy electronics laboratory, announced their find yesterday when they returned from a two-month exploration cruise.

They reported they surveyed 8,200 miles of the northeast Pacific, obtaining hydrographic data and also dredged up what may be the largest manganese concretion yet found—a 100-pound chunk the origin of which is in doubt.

They made the cruise aboard the Scripps oceanography ship Horizon.

[LINK](#)



# S. D. Science Vessel to Probe Pacific

By NORMAN BELL

Another expedition into the vast depths of the Pacific is under way with departure from San Diego of the research vessel Horizon.

The ship, with the latest oceanographic equipment, will survey the virtually uncharted area of the North Pacific between the Aleutian Islands and the San Francisco-Hawaii steamer lanes.

It is being sent out by the University of California's Scripps Institution of Oceanography, in cooperation with the Navy Electronics Laboratory. The office of Naval Research is sponsoring the expedition.

## EXTENSION PLANNED

Scripps scientists explained that the Horizon's new voyage will be an extension of expeditions which last year discovered and surveyed the submerged Mid-Pacific mountain range, west of Hawaii, and the Mendocino Escarpment—great submarine cliff that extends for hundreds of miles off the Northern California coast.

The new expedition will examine the northern ridge of the escarpment, dredging bottom samples and making soundings. It will then turn north to the center of the Gulf of Alaska.

Other samples will be dredged from the tops of sea mounts south of the Alaskan peninsula.

## ONE STOPOVER

After a call at Kodiak, the only stopover, the Horizon will continue the research southwestward along the Aleutian trench to Unimak Pass; then turn southward on an 1800-mile voyage to 500 miles northwest of Honolulu.

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## ONE STOPOVER

After a call at Kodiak, the only stopover, the Horizon will continue the research southwestward along the Aleutian trench to Unimak Pass; then turn southward on an 1800-mile voyage to 500 miles northwest of Honolulu. It will return to the California coast along a suspected escarpment facing the Mendocino Escarpment.

The Scripps Institution's newly developed mid-depth trawler will be used to investigate sea life between the surface layers and great depths.

Dr. Roger Revelle, Scripps director, and John D. Isaacs, assistant director, plan to join the expedition for part of the trip.

## SAVANTS CHOSEN

Five scientists chosen for the entire expedition are: Warren Wooster, Scripps chemical oceanographer; Dr. Henry W. Menard, of the Navy Electronics Laboratory; Jose Barandiaran, of the Peruvian Hydrographic Service; and Robert L. Wisner and Charles Dinkel, of Scripps.

Club Leader Seated

[LINK](#)

[LINK](#)



*They leave earlier...  
but stay longer!*

- Getting out the mail is often a tedious and tiring job. A postage meter helps both your mail and your Girl Friday to get away earlier... and adds to her satisfaction in the job.
- With the DM, every small office can have metered mail. This new desk model, little larger than your telephone, is a real postage meter... does away with stamp licking and sticking forever!
- The DM prints postage directly on the envelope, any amount needed, for any kind of mail. Prints a dated postmark at the same time, and a small advertisement, if you like... Holds as much postage as you want to buy, always provides the right postage... prevents loss, damage, "borrowing"... Has a built-in moistener for sealing envelope flaps, supplies postage for parcel post... And keeps its own postage records... Quick, efficient, convenient!
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Sources for Industry

Brookhaven National Laboratory announced this week that it has made some rather scary objects: radioactive sources as powerful as three or four pounds of radium.\* They glow in the dark with an eerie blue light and are so dangerous that they must be kept under several feet of water or behind thick lead or concrete shields.

The sources are made by "cooking" cobalt or tantalum tubes (13 in. long) in Brookhaven's nuclear reactor at Upton, N.Y. There the original metals turn into cobalt-60 and tantalum-182, both of which emit gamma rays with more than 1,000,000 electron volts of energy.

Brookhaven does not plan to ship its powerful playthings anywhere just yet; they are too dangerous to be allowed off the reservation. But it is inviting industrial scientists to send samples to be exposed to their radiation. Their hot blasts of gamma rays may prove to have valuable industrial properties. They can start or speed up chemical reactions, turn certain liquids (e.g., methyl methacrylate) into solid plastics. Their most valuable application may be in food processing, for their gamma rays reportedly kill microorganisms without heating the food material or making it radioactive.

Out of the Depths

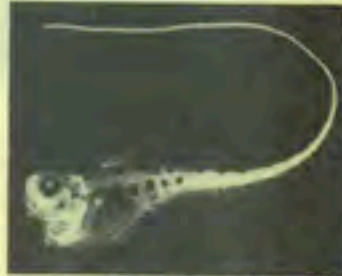
About the last of the earth's living creatures not catalogued by man live in the deep sea. Last week man's deep-sea fishing techniques were catching up with some of them.

Off Southern California, Dr. Carl L. Hubbs of the Scripps Institution of Oceanography was having good fishing with a new kind of deep-sea trawl. Its mouth is held open by a broad, V-shaped steel beam that acts like an airplane wing in reverse, making the net dive downward while giving it unusual stability. It can be towed at six knots, instead of the two knots which is top speed for ordinary trawls.

With his new, fast net, Dr. Hubbs catches faster fish, some of them as deep as 9,000 ft. "Every time we send the net down," says Hubbs, "we come up with something never before seen on this coast: fish with telescopic eyes, long fanglike teeth, dragonlike appearance." One fish caught has a long ratlike tail. Another, the black swallower, has an extensible stomach, convenient for heavy, infrequent meals. It can swallow a victim three times as big as itself. Another fish has a well-defined neck. Another has a huge lower jaw, a hundred times the size of the rest of its head, which it uses very much as Dr. Hubbs uses his trawl.

The present nets are at most 15 ft. wide, but Dr. Hubbs plans to build one 50 ft. wide, and catch even bigger and faster deep-sea inhabitants. Such creatures are

\* More than the entire world's pre-World War II supply.



Scripps Institution of Oceanography  
Dr. Hubbs's New Fish®  
At 9,000 feet, good trawling.

known to exist; sperm whales, for instance live mainly on giant squid taken at great depths. There is a chance that the new net may catch such a squid.

Off the Philippines, other scientific fishermen were combing even deeper waters. Dr. Anton F. Bruun of the Danish research ship *Galathea* reported that there seems to be no limit to the depths that life can sink. His men dredged the bottom of the Mindanao trench, the deepest part (35,400 ft.) of the ocean, never explored before. They hauled up 17 sea anemones, 61 sea cucumbers, two mollusks and one crustacean. All were comparatively fragile creatures, but they did not seem to mind living in darkness and cold more than six miles down, where the water pressure is more than seven tons a square inch.

Paradise Lost

When Dr. William Grey Walter of Bristol, England created his first mechanical turtles, Elmer and Elsie (TIME, March 27, 1950), he made them happy beasts. With their photoelectric eyes they could seek out the dim light that was suitable to bask in as well as the bright light that led them to their food, i.e., electric current to recharge their batteries. When they bumped into obstacles, they knew how to back away on their electrically driven wheels and try a different angle.

This was quite enough intelligence for a simple, happy life. Elmer and Elsie might

Top to bottom: black swallower, rat-tail grosser, *Metemphidax*.

## SEA SOUNDINGS IMPROVE

### Device for Measuring Depths Developed at Penn State

STATE COLLEGE, Pa., Aug. 25, Science Service — Improved equipment of the soundwave type for measuring the depth of the ocean has been developed here by Pennsylvania State College's ordnance research laboratory.

The sound-wave method of measuring sends powerful waves through the water to the ocean bed and picks up reflected waves. The elapsed time gives the measurement.

The device works on the principle that several metals, including nickel and certain nickel alloys, will contract and expand when a magnetic current is passed through them. The one developed here utilizes an iron-nickel core. It gives powerful sound waves through water when an alternating current is used.

An important use for the device is in the location of obstacles under water and the charting of the ocean floor. Commercial fishermen can employ it to locate schools of fish. The new device is said to be more compact and efficient than types previously developed.

[LINK](#)

## Seamount Statistics - Northern Holiday

Name	Date	Shoalest Depth	Bottom Depth	Height f.m.	Height Feet	Number Soundings	Log Book #	Page #	Remarks	
Sibert	16-17 Aug	620 fm	2300 fm	1680 fm	10,080'	550	1	67-90	Hydrographic casts at 4 points in vicinity - Dredge #1 - Surveyed	
Miller	18-19 Aug	520 fm	2200 fm	1680 fm	10,080'	925	2	2-43	Dredge #23 Core #4 - Surveyed BET Survey of 26 Sigs.	
Holiday	21 Aug	1080 fm	2100 fm	1020 fm	6,120'	150	2	46-51	Newly discovered - Surveyed but not dredged or cored	
GA-5	21 Aug	420 fm	2000 fm	1580 fm	9,480'	250	2	52-62	Surveyed	
Pratt	22 Aug	390 fm	2000 fm	1610	9,660'	475	2	63-84	Dredge #4 & #5 Surveyed	
GA-4	23 Aug	238 fm	2000 fm	1762	10,572'	175	2-3	88-76 81-1	Surveyed	
GA-3	24 Aug	410 fm	2100 fm	1690 fm	10,140'	250	3	3-12	Surveyed	
GA-1	25 Aug	1130 fm	2600 fm	1470 fm	8,820'	325	3	14-31	Surveyed	
5 Sept	5 Sept	2080 fm	2700 fm	620 fm	3,720'	100	3	60-64	Surveyed	
Sea Lump	7 Sept	2450 fm	2800 fm	350 fm	2,100'	20	3	70-71	not surveyed	
"	8 Sept	2250 fm	2880 fm	630 fm	3,780'	7	3	72	Water didn't tell name of it - not surveyed	
"	9 Sept	2590 fm	2800 fm	210 fm	1,260'	23	3	74-76	interesting depression before - not surveyed	
Mendocino Extension	11 Sept	2420 fm	3000 fm	580 fm	3,480'	100	3	80-95	Surveyed	
Sea Lump	13 Sept	2430 fm	3000 fm	530 fm	3,180'	15	4	3-6	not surveyed	
Scripps(?) Seamount	18-19 Sept	900 fm	2800	1900 fm	11,400'	850	4	25-40	Surveyed -	
<p>As of 22 Sept - 10 Seamounts Surveyed: 8 on first leg; 2 on 2<sup>nd</sup> leg                  Possible westward Extension at Mendocino Seamount Surveyed                  Three uncharted seamounts located &amp; surveyed (3 after ton)                  Three small seamounts (500 fm or less relief) crossed over (not of 10)                  One Seamount (8 Sept) passed over with the watch asleep.</p>										
Total	number of soundings to date:						8,575			

Thanks  
WHL

[LINK](#)

## INSTRUCTIONS FOR LABORATORY WATCH STANDERS

### I. GENERAL

1. Immediately upon relieving the watch, examine stowage of all scientific equipment. If the sea increases it is the responsibility of the watch to secure all loose scientific gear. Particular attention should be paid to gear stowed on deck - dredges, corers, meter-net, midwater trawls, etc.
2. Inspect all gear streamed over the side. Make certain GEX cable is not chafing and that THERMITOW is properly streamed.
3. You are responsible for general cleanliness and order in the laboratories.
4. During the watch you are responsible for the following observations:
  - a. Fathometer
  - b. Thermitow
  - c. GEX
  - d. Wind recorder
  - e. Bathythermograph
5. Enter in the General Log dates and times (GOT) and other pertinent detail for the following observations:
  - a. Hydrographic stations
  - b. GEX jogs
  - c. Midwater trawls
  - d. BT observations
  - e. Other observations of interest - large fish, sea mammals, newly-discovered land, icebergs, etc.

### II. FATHOMETER

1. On steaming watches soundings should be made at ten-minute intervals (preferably on the even ten-minutes) and at twenty-minute intervals during midwater trawls, unless otherwise directed by the Geologist. These soundings are entered in the Fathometer Log, using local time.
2. Enter also in the log and on the tape (when recording) all course and speed changes including hydrographic stations, GEX jogs and midwater trawls and any other information of value in interpreting the sounding data.
3. Notify the Geologist of
  - a. Unusual soundings or unexpected changes in depth
  - b. Malfunctioning of the Fathometer

[LINK](#)

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[LINK](#)

Instructions for Laboratory Watch Standers, Cont.

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III. THERMITOW

1. Enter on recorder paper:
  - a. Date-time (GCT), course and speed at least once each watch
  - b. All course and speed changes including hydrographic stations, OEX jogs and midwater trawls
  - c. Bucket temperatures, including date-time, whenever taken.
2. Just prior to hydrographic stations and midwater trawls, retrieve Thermitow, blow on element and place in bucket of water. The recorder can then be secured. When ship is underway again turn on recorder, blow on element and place back in the bag.
3. Notify Expedition Scientist of
  - a. Sudden large changes of surface temperature
  - b. Malfunctioning of instrument

IV. GEX

1. GEX jogs should be made every two hours at 5 minutes past the hour. Jogs should be made just prior to hydrographic stations and just after leaving them regardless of the time.
2. The instrument should be turned on one half hour before the jog (including a jog to be made on the next watch) and any changes in wave suppression switches made at least 5 minutes before the jog. Make certain that the pen is printing properly before starting jog.
3. Enter on recorder paper:
  - a. Jog number and date, name of observer
  - b. Base course, course changes and steady-ones (GCT times)
  - c. Signals for each base course and fixed course.
4. Complete all entries on GEX log sheet, except position, and enter jog in General Log.
5. Prior to arriving on station or taking midwater trawl, slow the ship to 3 knots and retrieve GEX cable and electrodes. Be certain plug is removed before starting GEX wind. Upon leaving station, cable and electrodes should be again streamed.
6. Notify Expedition Scientist of malfunctioning of GEX.

V. WIND RECORDER

1. The wind recorder should be wound each morning at 0800.
2. Enter on recorder paper:
  - a. Date-time (GCT) course and speed at least once each watch

[LINK](#)

Code 2236  
U. S. Navy Electronics Lab  
San Diego 62, Calif.  
7 Aug 1969

Dear Steve:

Enclosed is what we have on the rock dredge. Also included is the material for making up the chain bag and the inside netting. We also used to place small pipe dredges on the bottom of the bag to catch the fines; this was simply a large diameter gas pipe with wire at one end (mesh) and a small wire yoke at the top end.



heavy wire  
mesh, welded  
to pipe, or



inside bag



<sup>2</sup> or a canvas bag  
The chain bag is made up by deciding how long you want the bag to be and cutting the correct number of lengths of chain, attaching them at one end to the holes around the lower edge of the steel box. The lap links are used for this purpose. After the chains are attached, then they are secured together in a sort of mesh by connecting adjacent chains with lap links.



(with the chains)

After the lap links have made up an open-ended bag, the lower end of the chain bag is drawn together with 3/16 or other steel wire. The shrimp setting is then used to make up an interior bag to fit inside the chain bag; it is secured at the top through the holes around the lower edge of the steel box. It is a good idea to tie it down to the bottom end of the chain so that it doesn't come out during lowering.

In the past, wire has been used to secure the chains to the steel box, and wire clips have secured the chains together to make a bag, but the lap links are better, and what we have used for the last few years.

I don't have any data on how much this will cost, it has been several years since we made up the last batch of dredges.

If I can help out, further, let me know.

We are looking forward to seeing you and the new wife in New York. We should have about nine people from the Lab and scores from Scripps; not all of us from the Lab, however, will be on Govt orders--details not settled yet. As ever,

LINK



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San Diego 62, Calif.  
7 Aug 1969

Dear Stew:

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mesh, welded  
to pipe, or



inside bag



or a canvas bag

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6 foot length  
of chain

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LINK

301 -

Thanks - very  
interesting photos.

Hope you can keep  
these notes or the pertinent  
photo here for awhile, in  
the event questions are  
raised about this supplemental  
equipment.

Fred

[LINK](#)

Dr. Stewart:

Thank you very much  
for making the attached  
material available to me.  
It has proved to be  
indispensable in evaluating  
the Northern Holiday  
hydro.

NI<sup>c</sup>Alinden  
12-9-63

[LINK](#)

**PHASE TIME and ATTENDANCE**

Payperiod:		Start:					End:								
PHASE candidate name:		Hours Worked													
		Week One							Week Two						
		Sun	Mon	Tues	Wed	Thurs	Fri	Sat	Sun	Mon	Tues	Wed	Thurs	Fri	Sat
Duty	From:														
Hours	To:														
Work	From:														
Hours	To:														
Total Hours Worked															
Comments:															
PHASE Signature				Date				Supervisor Signature				Date			

Fax to: Dr. Bob Mahler  
(303)492-1585

[LINK](#)



[LINK](#)