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Vol. 4

ENIWETOK LAE

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Vol. IV

June 23 to Aug. 10

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~~CONFIDENTIAL~~ ED FISHERIES LABORATORY  
SEATTLE, WASHINGTON

Locality Ellice Date Wednesday June 23 1954  
Personnel Welande, Lowman Weather Generally fair  
Palmbo, Seymour Water conditions \_\_\_\_\_

Radiation level(s) Counting Room Background

Operations:

Processing June 19, 21 and 22nd collections.  
P.M. aqua lunging for an hour or so.  
Picked up Ellice samples for the circuit tests.  
Received air freight shipment of two PRO cans that  
was shipped from Seattle previous to Art and Frank's departure.  
Also received 4 plankton nets by air mail. Thanks for the  
good job in relatching up all of the supplies.

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SEATTLE, WASHINGTON

Locality Elmer Janet Date Thursday June 29, 1954  
 Personnel Welande Lowman Weather Cloudy  
Palumbo, Suzanne Water conditions \_\_\_\_\_  
"Palumbo's Farewell"

Radiation level(s) Counting Room Background (~~from 200~~) with new counting  
 Operations: tube 60 cpm

Being sent back to with Ralph are the following  
 cards and samples

	Numbers	Cards	Samples	Total
FISH	8501-8650	✓	✓	150
SOILS & WATER	9157-9195	✓	✓	34
PLANKTON	8219-8228	✓	✓	10
INVERTEBRATES	5661-5710	✓	✓	50
"	5711-5801	✓	✓	91
RATS	9315-9338	✓	✓	24
"	9379-9381	✓	✓	3
PLANTS	6585-6760	✓	✓	176
				543

Also daily logs June 20 to 23 inclusive will go with Ralph.

We are now assigning numbers for future needs as follows

- Water and Soils 9701-10000
- Plants (algae + land p.) 10001-11000
- Invertebrates 11001-12000
- Fish 12001-13000

Note: Cards in the future will be numbered at the Euvetop Lab.

SHORT ITEM: 5000 Cellophane plant bags similar to those we had in 1952. Believe Kelly knows where to obtain them. Can order 1000 upon delivery and send the remainder with the next "guest" to the "Garden Spot of the Pacific". We find the plant bags much superior to

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Continued (2)

Locality Elmer Janet Date Thurs. June 29  
Personnel \_\_\_\_\_ Weather \_\_\_\_\_  
\_\_\_\_\_ Water conditions \_\_\_\_\_

Radiation level(s) \_\_\_\_\_

Operations:

the coin envelopes for holding samples for shipment.  
Ralph left barracks at 1330 to go to Fred & check  
in for tomorrow morning flight.  
1400 Lorman and Seymour to Janet to set 22  
rat traps. Returns left Janet at 1600.  
Wlander processing Bikini fish samples.  
The counting tube in the counting room was replaced  
by a tube (borrowed from Taft) which is self quenching and  
will give counts up to ~100,000/min without jamming.  
The volume of the tube is slightly greater thus giving a  
higher background count. Counting efficiency is also  
slightly increased.

APPLIED FISHERIES LABORATORY

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SEATTLE, WASHINGTON

Locality Chase Belle Date Friday June 25 1954  
Personnel Uklander, Lammann, Seymour Weather Cloudy with some sun  
Water conditions Rough - white caps on bay

Radiation level(s) Counting Room Background - 58 cpm (new tube) i.e. Counting tube  
Operations: Belle: 8, 12 m/hr at 3' 28 m/hr at 3' & at 1"

0800 Departed from Belle to pick up rat traps at Janet then on to Belle for "weekly collection". No catch in the 25 traps at Janet although traps were carefully set in areas where fish signs & rats were apparent. Saw 3 rats while picking up traps. Rats were abundant.

~0900 Belle - Survey meter readings above. Collected 3 *Chironomids* in usual spot area H.; one *T. Crossa* in area G; *Sesuvium* plant samples from #1319 area D; *Halimeda* and *Dictyota* from area E. Fish poisoned in area E big kill of goat fish but only a few of other species; also poisoned in area F with old rotenone small kill but one large stonefish, *Syngnathus*, which is being preserved. Two fairy terns shot. An occasional ruddy turn seen but not within shooting distance.

Drs. Odum and Odum now working at the lab.

Mr. Hardison received a letter from Mr. Spain in which two times totaling about \$1000 were transferred from our account to "operations" and hence the money remaining in our "\$5000 Fund" is now increased from ~\$2000 to ~\$3000.

IVES

CLARK

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SEATTLE, WASHINGTON

Locality Elmer Date Saturday June 26, 1954  
 Personnel Welande, Louman, Sigmon Weather Wind + rain 2. PM. Cloudy, low wind P  
 Water conditions Rough in A.M.

Radiation level(s) Counting Room Background - 57, 55 cpm

Operations: AM and PM Processing this weeks collection - dissection, weighing, numbering, filling out cards, etc.

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Locality Elmer Date Sunday June 27, 1954  
Personnel Welandu, Leonard, Seymour Weather Shanny  
Water conditions \_\_\_\_\_

Radiation level(s) No by count

Operations: Charged aqua lung tanks and went aqua lunging with Dr. Gabriell in the afternoon. Aqua lunging cut short because of oil in air. Broke leg on air control on one tank.

Short item: The 5 ml. volumetric pipettes are no help for water samples. Need either (1) a 2 1/2 ml vol. pipette or (2) a 3 ml and a 2 ml vol. pipette or (3) a graduated ~~glass~~ pipette, preferably 6 ml.

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Locality Elmer Date Monday June 28, 1954  
Personnel W. Clausen, Foreman, Seymour Weather Rainy  
Water conditions \_\_\_\_\_

Radiation level(s) Background in Counting Room - 610/m

Operations:

Processing last weeks collection

Took valve from spare being to machine shop to be repaired. Required a work order.  
Made arrangements for W. Clausen, <sup>Seymour</sup> to go to Kwajalein to see what fish are being caught in the native fishery. We leave Everett on Wednesday morning and return from Kwaj on a Thursday afternoon flight.

Placed a work order for an "M" boat for Tuesday July 6 for plankton and water samples. Island Sweep making collections off Wide Passage, Leovy, Belle Uva and Deep Entrance.

Picked up memo regarding switching of charges against our fund to operations. See log for June 25<sup>th</sup>

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Locality Elmer Date Tuesday, June 24<sup>th</sup>, 1959  
 Personnel Welandu, Seymour AND LOWMAN Weather Showers AM  
 Water conditions windy

Radiation level(s) Background, counting room - 59 cpm

## Operations:

Cancelled Welandu and Seymour's trip to Korojaka because of expected arrival of Dr. Donaldson and Boss. ~~to telegraph~~ this morning regarding their clearance gave the ETA as June 29. Set up flight schedules for Wednesday and Thursday. Because of difficulties of getting a suitable charter for Belle have given up the idea and will use barge on the lake for rubber boat if it becomes necessary to have a boat in the Belle area.

Turned in film badges A92 (Palumbo), A93 (Seymour), A107 (Welandu) and A108 (Lowman).

Picked up fitting for an valve on aqua lung. A stainless steel key was silver soldered to replace the broken brass key. Marshall Shop Sept. is Mr. Hunter.

Picked up reef bag from Mr. Simons at the sail loft. Letter concerning budget (from Mrs. Malin) received today. Looks like everything is well taken care of and we have no comments. Will save for Dr. Donaldson if he should come here before Seattle.

Processed ~~rest of samples~~ <sup>samples</sup>, packaged already for shipment. Welandu added about 150 species to the illustrated Fish book on Marshall Ids fauna.

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FISH ARCHIVES

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Locality Elmer-Jamet Date Wednesday June 30  
Personnel Wolander, Seymour & Loun Weather Fair  
S Water conditions fairly smooth

Radiation level(s) Brand-counter room. 59

Operations:

Will Paul order and send out a new indicator lamp for the drying oven like the one on the oven at the lab.

Added Drs. Odum and Odum to Tomorrow's flight. Moved drying oven under hood and alongside ruffle furnace. Centrifuge put in air conditioned room.

Deppow's flight set up for July 9<sup>th</sup>. Will go straight there to Travis and then arrange for transportation to Seattle from his own funds.

AM Cleaning up Lab

PM Wolander working in lab. Lounman and Seymour to Jamet to hunt birds and rats and to set traps. Flushed out several rats and by combining the shot gun with Alf's ability to stomp them into the ground we took 4. They weren't torn up at all so the tissues should be in good shape. Set the traps and rode back thru rain storm.

Received letter from Colombo sent from Hickam where he was being delayed.

Sign points (none not taken) to specimens in the lab; that some of the signs be painted at Bitter Lake located upon the beach at Point after the March 1 shot. This would indicate the possible source of contamination of the Aspergillus along Parry's outside Reef.

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~~CONFIDENTIAL USE ONLY~~Locality Elmer, Janet, Belle Date Thursday July 1Personnel Wilkens, Lamm, Seymour Weather Pt. Cloudy

Water conditions \_\_\_\_\_

Radiation level(s) Grinding Room Background Air Temp - high 89°FOperations: Belle, in Mr/hrs, - 8, 10: 30, 25.

0800 left Elmer for Janet to pick up rat traps. In 22 traps ~~in catch~~  
 Although many rats were seen. Ran down and caught a few ~~that~~  
 which were taken to Belle at Belle took ~~in catch~~

Algae was taken from area E; clam from area G. Several plants,  
 fish from area F, Anobita from area H. water reading at ~~catch~~  
~~catch~~ point; and water sample from area E.

Returned to Elmer at 1205

PM Weighing, dissecting today's samples. All of today's  
 samples in bringing over by 1730.

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Locality

Chum

Date

Friday July 2<sup>nd</sup> 1954

Personnel

Laurian, Welandu, Szymon

Weather

Fair

Water conditions

Radiation level(s)

Counting Room Background, 55 c/m

Operations:

Processing yesterday squelching weighing bags etc.

AEC office was informed that Dr. Pearson, Cass and Heath will leave Hickam for Eniwetok about July 5<sup>th</sup>Dr. ~~Smith~~ is scheduled to arrive here tomorrow July 3<sup>rd</sup>

Made reservations for flight to Edue tomorrow to pick up fish collection (as near to water area as possible).

There is good news today - a letter received from Dr. Smith and a TUX from Dr. Bonham intimated that Dr. Donohue should be here this weekend and that Mr. Quatke should soon leave his vacation. The TUX also stated that transportation had been arranged via PAA from Honolulu to Seattle for Szymon.

In addition to the TUX there was also a letter from Dr. Bonham of June 25<sup>th</sup> and enclosed was a copy of the letter to Dr. Pearson regarding comets of tuna and other pelagic like fishes.Processed rats collected June 30<sup>th</sup> and birds collected July 1<sup>st</sup>UNIVERSITY ARCHIVES  
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Locality Ellice, Edna Date Saturday July 3, 1954  
Personnel Hlauder, Louman, Seymour Weather Rain early morning, then clearing  
Water conditions rough

Radiation level(s) Counting room background, 57 C/m  
Operations: Edna - Forly; black 5-30 mv./hr  
above high tide line, 150-400 mv./hr.

0800 left Ellice for Edna. Collected fish algae, invertebrates and took water sample and water readings. Worked east end of island bordering Crater area. Island is only a sandbar, no living sea plants. No live coral seen. Only invertebrates seen were some small gorgonian coral that were sampled and very small, found crabs that were not sampled. Algae samples #1691, 1692 and 1693 growing abundantly in some areas. Flots were prominent in tide pool behind a bar on the north east end of the Island - the bar bordering on the crater. Many fish of a wide variety of species were captured but all of small size. A goat fish weighing 26 grams was the largest fish. Nothing larger than the goat fish was seen other than 7 or 8 black tip sharks, *Chalchardinius melanoptera* which were about 15 to 18 inches long. 1100 left Edna for Ellice

a TWD from Los Alamos to the Security Office here said that Lt Comdr. Rautzke would be a visitor to the PPG area between July 1 and 31.

PM Processing today's collection, all samples in drying oven by 1700.

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Locality Elnor Date Sunday July 7, 1954  
Personnel Donaldson, Symons Weather Rain early during the day  
Lawman + Melander Water conditions Average

Radiation level(s) Counting room background 60R/hr

Operations:

Big day - Donaldson arrived on Elnor about 9 am. Beat the game till lunch, continued after lunch till 2:30 am. Aqua-lung practice off buoy in 10' of water but found the oil emulsification in the compressed air too much for us & returned to shore after about 1/2 hour. We will have a filter placed on the compressor before we venture out again.

Spent part of time reading Lauren's Mail. Lauren busy answering letters.

Sent TWX to Pearson at Honolulu asking for ~~your~~ official OK. of Resurvey of Rongelap Wednesday or Thursday July 7 or 8. as follows:

"Pass to Paul B. Pearson or William K. Boss from Lauren R Donaldson PD  
Does AEC desire a resurvey of Rongelap Atoll at this time. Once have available experienced man power to make survey this week if desired PD Plane available for one day air trip PD Refer to go July 7.

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July 5<sup>th</sup> on following

Locality Elmer - Wide Passage - Jerry - Belle

Date Tuesday July 5<sup>th</sup> 1954

Personnel Vera - Deep Entrance  
Donaldson Uelanden

Weather Cloudy & raining at times

Lawman & Seymour

Water conditions relatively smooth

"Plankton, Water Samples & Fishing"

Radiation level(s)

Operations:

0755 Donaldson Uelanden & Seymour (also Duprez, Bradley, Springs and —) left Elmer for plankton, water sample & fishing trip. Lawman waiting for fax from Pearson in reply to message sent yesterday and working in laboratory. No reply received.

0853 Nets out west side of Wide Passage. Hauls two were sent monthly received from Schroeder - one net #6 with 74 meshes per in. The other #20 with 113 meshes per in. Water temp. 82°F. Windy.

0908 Nets in - good catch - running for Jerry, Bradley caught a 3 1/2 x 4 foot shark while we were drifting with plankton nets.

1007 school of porpoise

1055 nets out 2 miles North of Jerry. Water temp 82°F. Windy.

1115 nets in running for Belle. Bradley caught another shark while drifting for plankton. Slightly larger than first.

1210 — caught a barracuda 10-12 lbs in weight.

1253 Nets out Belle - Started raining about 1130 - water temp 8

1312 Nets in running for Vera still raining

1432 Nets out - about 3/4 of a mile off Vera - raining slightly Temp 8  
1455 Nets in running for Deep Entrance - Bradley caught a ~~snapper~~ <sup>snapper</sup> while drifting for plankton. Tail end of fish bitten off before it was landed.

1630 Nets out in Deep Entrance just off Fishing Barge. Raining.

1652 Nets in running for Elmer. Water temp 81°F. Drifted ~ 3/4 of a mile while towing nets.

1700 Elmer

PM Processing plankton samples

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Locality Elmer Date Monday July 5<sup>th</sup> 1957

Personnel Donaldson, Oklander, Weather Rainy

Louman & Seymour Water conditions \_\_\_\_\_

Radiation level(s) \_\_\_\_\_

Operations:  
A.M. cleaned house processing samples, taking traps  
felling out cards etc.  
P.M. Completed all of last weeks samples. Ripped  
new plankton nets, got ready for tomorrow's plankton  
traps

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Locality Elmer - Janet Date Wednesday July 7<sup>th</sup>  
 Personnel Ronaldson, Welander, Lowman Weather occasional shower mostly sunny  
Seymour Water conditions \_\_\_\_\_

Radiation level(s) Counting Room Background, 56 Cpm

## Operations:

A.M. Processing the 2 shark, baramunda and snapper caught yesterday as well as the plankton and water samples.  
 1 PM Welander counted water samples and made fish necropsy notes. Ronaldson, Lowman, & Seymour at 1300 to Janet to collect rats and birds. Shot 1 and was down 2 rats. no birds. ~~eth~~ etherized them frozen upon returning to lab at 1600.  
 No reply to HOB of July 5<sup>th</sup> to Dr. Pearson. Drs. Pearson, Bond & Hall arrived at Everett this morning (Perry & DeLank) but left for Majuro before contacting Laboratory. Seymour or ~~not~~ wait for Roughlap survey, if and when it is approved.

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Locality \_\_\_\_\_ Date Wednesday July 7<sup>th</sup> Coast

Personnel \_\_\_\_\_ Weather \_\_\_\_\_

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Water conditions \_\_\_\_\_

Radiation level(s) \_\_\_\_\_

Operations:

*Supervisor will take log of July 4-7 inclusive and cards as follows*

FKSH	Parkini	June 22	8651-8775		
	Belle	June 25 + July 1	8776-8950	8651-9000	
	Edna	July 3	8951-9000	12001-12020	
	"Plankton Trip"	July 6	12001-20		570

INVERTEBRATES	Circuit Sweep	June 21	5802-81		
	Parkini	June 22	5903-38		
	Belle	June 25 + July 1	5882-5902 5939-5959		
	Edna	July 3	5960-5969		
	Janet	" "	7 5965-76	5802-5976	175

PLANTS	Belle	June 25 - July 1	6761-92		
	Edna	July 3	6793-6800	6761-6800	90

PLANKTON	5 Station Sweep	July 6	8229-38	8229-8238	10
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PLANTS & BIRDS	Belle	Mar 28; June 4; June 11	9339-46 9355-78 9382-86 9385-85 9478-93		
	" "	June 25; July 1			
	Janet	June 3	9347-54		
	Parkini	June 22	9387-9434	9339-9339	
	Janet	June 30	9446-77	9382-9493	152

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WATER	Circuit Sweep	June 21	9196-9200 9701-9731		
	Belle	June 25 + July 1	9732-35		
	Edna	July 3	9736-39	9196-9200	54
	"Plankton Trip"	July 6	9740-49	9701-9759	54

Total cards and samples 801

Also 10 samples of fish for radiochemical analysis.  
 These were caught at Edna July 3<sup>rd</sup>. 5 larvae from yellow Snapper 5m

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Locality Elmer - Belle Date July 8, 1955  
Personnel Seymour, Donaldson Weather Fair  
Welander, Loman Water conditions Smooth

Radiation level(s) Belle 8 - 6 1/2 mcp/hr, P.V. - 18 mcp/hr, Counting  
room 56 cpm.  
Operations:

8:00 am left for Belle for weekly collection. Alga from Area F, water sample from Area E. *Caecidifera* H (the supply of this species is getting scarce - could get only small specimens today). *Scaevola* sample from pla #1319, Meter reading at central survey point, Pool shot 2 fairy terns, Clam from Area G, Fish from Area F. Left some rotenone at Belle. Returned to Elmer at 11:25.

At 1:30 pm Al left for Fred where tomorrow will don long sleeves & trousers and head for civilization via MATS.

The compressor men were here in the PM to find out where the oil leak into the air tanks is located. No conclusive results yet.

Doe, Art + FGL dissected, weighed and prepared samples in P.M. Water sample taken at Belle counted

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Locality Elmer, ~~Elmer, Bally, Elmer~~ Date July 9, 1954

Personnel Donaldson, Welander, Lawman Weather Fair

Water conditions Smooth

Radiation level(s) Bq in counter room 55

Operations:

In AM Lawman dissected 3 rats from Janet. All heads packaged dry samples and cleaned up lab. Ran decay curves and had session with Pearson & Bass in PM. Compressor man working on compressor with no luck. Went to Col. Leukki's going away party in evening. Welander typed report on operations schedule all evening for Pearson.

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DATE

Locality Elmer, Janet, Edna, Belle Date July 10, 1954  
Personnel Danzon, Welander, Lawman Weather Fair  
Water conditions Smooth

Radiation level(s) Beach at Elmer 30mr/hr, high water line 150mr/hr,  
center of island 400 mr/hr. Background <sup>counting</sup> room = 51 c/m.

Operations: 0800 boarded helicopter w/ Boss & Pearson & proceeded to  
Janet. Shot one rat and inspected building on island.  
Stopped at Edna and examined areas - caught 7 pelagic  
jacks - asked 5 - could have taken more from island.  
Hit pool. ~~Wander~~ Didn't see any birds. Stopped at Belle;  
went to <sup>north-</sup> east end of Belle. Shot one fairy tern.  
Returned to Elmer at 11:00. Dissected & weighed  
samples taken in AM during the afternoon. Completed  
decay curves.

Saw some ghost crab holes on Edna. Plan  
to survey Edna and observe from time to time the  
changes that take place.

counts 12071-12095 processed (fish)

Birds & Rats 9531-9545

Invertebrates 5977-80, 11001-11

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Locality Elmer Date July 11, 1954  
Personnel Donaldson, Jones, Weather Fair  
Wellander Water conditions Fair

Radiation level(s) — 59 c/m

Operations:  
Donaldson writing letters, generally trying to catch up on correspondence  
Jones working on his Electronically microscopical anatomical studies.  
Wellander trying to get off — finally forced to go to lab & package samples of the previous week, cleaning out the oven of all material.  
Reported refrigerator in Barracks 121.

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SEATTLE, WASHINGTON

Locality Parry Island Date July 12, 1954  
 Personnel Donaldson, Melander Weather 91° F (5.15 P.M.)  
Lawman Water conditions Smooth

Radiation level(s) Background 5.2/m

## Operations:

The surplus deepfreezer turned over to H.M. for storage came up for discussion. Because A.E.C. questioned the decision to surplus this piece of equipment, the entire history of the request, delivery and disposal of the deepfreezer was reviewed with Tom Harding, A.P.C. Resident Engineer and Dr. Rolt Hiatt.

Plans for making a topographical survey of Edna were put in operation. Stakes were procured from the carpenter shop for marking the survey points.

H.M. came to the laboratory to arrange for janitor service, they were asked to clean the floors - only not to touch the tables, benches or desks.

A woman continued to run dining covers, weighed bags, asked material.

Trip to Rongelap Atoll is scheduled for Friday, July 16. We are to be ready to leave here at 7:15 P.M.

Donaldson made tracings of the scale maps of Olive and Yorg. Copies we made to take to U of W for reference and to be used in report writing.

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Locality Elmer, Edna Date July 13, 1954  
Personnel Donaldson, Lawson Weather Occasional showers  
Delander Water conditions Fair  
Temp. 87° F. (5:45 PM)  
Radiation level(s) 54 c/m at Lake

Operations:

Left Elmer for Edna 0800. Before landing at Edna circled the island while Frank took photos with the Goflex.

Set up survey points on the island preparatory to putting in the essential physical features. Were hampered to some extent by a heavy shower & barely finished the survey by 1130 when the Copter removed us, wet & dripping from the island.

P.M. Spent sketching maps, Lawson making up the map of Edna using measurements & points obtained with the Alidade.

4 Iron stakes were driven into the island at high tide level which connect with a central Iron stake at the survey point. A number of wooden stakes were driven at 100' intervals which form a cross pattern on the island.

Biologically we saw a sprouting onion lying some distance from the water & Lawson planted it. Also an larvip can be added to the fauna of Edna Island.

Lt. Commander Clarence Frederic Pautzke U.S.N.R. reported in to this command at 1800 hours - soap x

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Locality Clawson Daisy Date July 14, 1954  
Personnel Ward, Sweeney, Poutyke & McEnder Weather Fair  
Water conditions Smooth

Radiation level(s) Counter background 52 c/m, Daisy 10-12 gamma  
30-beta-gamma

Operations:

Left Claws at 9:00 AM for Daisy to  
make a survey of the island and set  
up stations for future reference. As we  
approached the island by "Copter Frank took  
photographs with his "Geographic".

Survey was made by outlining the island  
at the high tide line on a scale of 1" = 100'  
was used. Transit lines running north-  
south and east-west were marked out  
using wooden stakes at 100' intervals  
and iron rods at the ends of the sections.

Two fairy terns were shot and  
after dissection the tissues were placed in  
envelopes to dry. #

Four (4) samples of algae were  
collected plate # 6817-6820 were  
prepared.

Coast rocks were seen just above  
the high tide line. No vegetation was  
observed on the island. Fish were seen  
in the waters around the island and  
a number of birds of prey were seen  
feeding on the rocks.

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Locality Edna + Belle Date July 15 '54  
Personnel Perwick, Donaldson, Weather Fair  
Welander + Lawson Water conditions Smooth

Salinity level(s) Belle 8 cm/hr for 20m/hr  
Count room 54 c/m

Operations:  
Proceeded to Belle by helicopter at 0800. Donaldson & Lawson ran a survey of the island and set up streams along two transect lines. Collected coenobitic, birds, algae, land plants & Welander poisoned for fish, took water samples, algae, & clam. In PM dissected morning's collection, weighed & placed in oven. Developed 4x5 shots of Edna & Daisy - Srink. Prepared for tomorrow's trip to Pongelap.

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Locality Elmer - Rongelap Atoll Date July 16, 1954  
Personnel Lawman, Pantzke Weather Clear AM - fair PM.  
Melander & Donaldson Water conditions Smooth

Radiation level(s) Elmer 51  $\mu$ /me Rongelap - as noted below.

Operations:

Storm during the night with high winds and heavy seas.

Left Elmer at 6<sup>30</sup> AM. in an "M" boat for F.S. for a recovery trip to Rongelap Atoll. Arrangements for the trip were made through Mr. Tom Hardison to Kwajalein to provide Navy Transportation.

At 7<sup>30</sup> AM. a U.S. Navy Grumman "Albatross" arrived from Kwaj. (U.S.N. ASR-16 #90) Commander C.W. Heywood } pilots  
Lt. L.M. Guerrieri }  
2 crew members.

Program 19 members:  
Frank Lawman  
Rt. Cdr. C.F. Pantzke  
A.D. Melander  
Lawson P. Donaldson

D.F.C. Radiological Safety members:  
Robert T. East  
Wm. Blakeman

A light left F-red at 8<sup>30</sup> and arrived at the north end of Rongelap Atoll off Kapelle Island at 11<sup>15</sup> AM. Rubber raft was inflated and a landing made on Kapelle Island where collections were made. The same general

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Locality Elmer - Rangulap Date July 16, 1954 (cont)

Personnel \_\_\_\_\_ Weather \_\_\_\_\_

Water conditions \_\_\_\_\_

Radiation level(s) \_\_\_\_\_

Operations:

Areas sampled on March 1954

Levels of surface radiation were measured with Geon A.E.C. model SIC-17C, serial no. \_\_\_\_\_ Readings were made at 3' and at 1", & peaks at 3' were made with the beta shield close and at 1" with the beta shield open.

<u>Area and conditions</u>	<u>3' r</u>	<u>1" p+r</u>
Low water line	91	15 p+r
High tide marks on bush	20	70
50' inches from high tide line	29	100
100' " " " " "	28	100
On seaweed bush	28	100
Under <i>Mussurhanshitti</i>	30	100
Lee edge of coconut grove	20	80
Middle of island inland bush	25	90
Open clearing in middle of island	27	45
Middle of coconut grove	20	60

collections were made of fish in the channel on the N.W. end of Kapelle Island, Algae and invertebrates in the same general areas. Land plants, birds, and insects were collected on the near Kapelle Island. Plantation towers were made on the edge of the shield on the lagoon side. Returned to Field at 6:15 p.m. and Elmer 7:10

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Locality Alaska Date July 17, 1954  
 Personnel Paulsen, W. Anderson Weather Fair  
L. Swenson, J. Donaldson Water conditions Smooth

Radiation level(s) Background 51%

Operations:

Packaging the samples of material collected. I took all the Al samples left preparing to ship the material to the A.F.C. by air mail. Following samples and cards included in this shipment:

Water samples	09750-09771	- 22
Plants and algae	6801-6836	- 36
Birds & nests	9494-9597	- 84
Fish	12021-12145	- 125
Invertebrates	{05977-05980}	- 4
	{11001-11038}	- 38
		<u>309</u>

Worked on B. m. collection, preparing tissues for dehydration.

Mr. John C. Kyriacopoulos, A.F.C. Resident manager, visited the laboratory to meet the men working at the laboratory and learn the nature of their work and the needs for support.

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Locality Algaes - Date July 18, 1954 (Su)  
 Personnel McLander, Donaldson Weather showers 77F. min 98F. max  
Lusman, Pauls Water conditions smooth

Station level(s) Background, 51 ym.

Operations:  
 Spent the day working up material collected at Rodriguez & Pisk, invertebrates, coconuts, algae, plankton, water samples etc. were finished up and placed in the dryer.  
 Decay curves run on samples collected at prior dates.

Kay - order a dozen "Jug-a-Lug" ship out a carton of 4 or 6 which ever is contained in the rigid carton - or send out a carton with the next replacement that comes out - Kelly or Ralph.

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Locality Clamas Date July 19, 1954 (Mon)  
Personnel Malden, Lawson Weather Fair  
Pantyke + Willander Water conditions Smooth

Radiation level(s)

Operation:

Work continued on the preparation  
of material collected at Ringlip.  
Pantyke described birds and fish and tissues  
Lawson worked on bird eggs and other samples  
Malden weighed samples  
Willander prepared equipment and collection  
lists for the present tour scheduled for  
tomorrow. Identified fish for Pantyke + filled cards.

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Locality Claver and Islands on Date July 20, 1954  
Personnel Lagman, Paultyke Weather Fair 95°F - 97°F in  
Wielandts & Donaldson Water conditions Smooth

Readings were made in m.c./hr with nuclear G.M.

Reflection level(s) airial No 118. Bruce 3'-.2, 1'-.25. Yvonne 3'-.7

Operations: 1" - 1.0 m.c./hr. Vera 3'-.6, 1'-.30. Olive 3'-.5 m.c./hr, 1'-.7  
Janet 3'-.17, 1'-.12; Alice 3'-.12, 1'-.18; & way 3'-.1, 1'-.7.6  
Started on current tower in Copter at 8:10

8:10 Aerial from Claver. Steps were made at the following locations for collections:

1. Bruce - Halothuria on outer edge - southern end of island.

2. Yvonne - no Halothuria found at north end of island - numbers seen at the N.W. end of reef flat.

3. Vera - good collections

4. Olive - good collections

5. Janet - Poor collecting northern and western sides of island. South end much better.

6. Alice - Halothuria scarce

7. & way - current of island and reefs on both sides - no Halothuria.

8. Henry - Halothuria - found only under rocks on outer reef flat x

9. Claver -

Entire current tower is a very rough assignment for one day - I suggest be reduced by cutting out one or two stations. P. D. Pruitt (Yvonne) contributes little. And Janet can be done the next day with the reef collection.

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Locality Clawson Islet Date July 21, 1954  
Personnel Pantje, Lowman Weather Shower  
Walden & Lowman Water conditions Smooth

Radiation level(s)

Operations:

Packaged material collected at Pangloss and prepared it for shipment to A. F. L.  
Shipment included following cards & samples.

<u>P. Loxton</u>	<u>8239 - 8240</u>	<u>- 2</u>
<u>Invertebrates</u>	<u>11039 - 11083</u>	<u>- 45</u>
<u>Plants</u>	<u>6837 - 6904</u>	<u>- 68</u>
<u>Birds &amp; rats</u>	<u>9608 - 9679</u>	<u>- 72</u>
<u>Fish</u>	<u>12146 - 12260</u>	<u>- 115</u>
<u>Soil</u>	<u>9772 - 9773</u>	<u>- 2</u>
<u>and 8 vials of plankton</u>		<u>304</u>

Lowman and Pantje went to Janet in an L-20 to collect rats and build rat shelter. It was observed that the rats were hiding or living under sheets of metal - so by lifting the metal the rats were exposed and might be captured.

In the afternoon all hands worked at processing the material from the Periwinkle tour.

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Locality Elmer + Belle Date July 22, 1954  
Personnel W. Anderson, Donald Drake Weather Fair  
Larsson + Pautzke Water conditions average

Radiation level(s) 50 cpm background at Elmer.

Operations:

Spent the entire day working like —! on the material collected on the circuit tour of July 20, and making the regular weekly collection trip to Belle.

The trip to Belle was without incident except for the trip were:

1. Frank exposed part of a roll of Kodak movie film of activities of the groups, dead birds, rats and fish left on the island by the skink that.

2. Survey stakes were placed on the transect lines and numbered for distance from the central zero point.

The growth of the vegetation has been such that taller stakes were needed to see the transect lines. It may be necessary to cut out a lane along the transect lines so that they will be identifiable.

Prepared for the Pitkin trip on the evening and rigged the new rubber raft for use with the 5 1/2 hp Johnson motor.

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Locality Elmer and Bikini Date July 23, 1954  
Personnel Lowman, Pauzy and Klander Weather Showers  
+ Ross Taft - Red. Exp. Water conditions Heavy swells

Radiation level(s) 50  $\mu$ /m background at Elmer.

Operations:

Left Elmer at 6:45 AM for Fred  
to board the plane for Bikini.  
The plane a Navy A PS-16, Albatross, #912 arrived from Ft. Wajalein at  
7:45 AM and left for Bikini with our  
party and equipment on board at 8:30 AM.

Arrived at Bikini at 9:50 and landed  
near the north central section of the atoll.  
Landing was very rough for swells were  
coming in from the south.

Went ashore in our rubber raft  
powered with a 5 1/2 horsepower Johnson  
motor and landed through the surf with  
no particular stresses.

Pauzy and Klander made plankton  
tows using the rubber raft - motor, with  
fine x

Lowman, Taft & Donaldson made a  
radiological survey of Fox Island - or  
what remained of Fox (R. Oriskany) Island.  
Surveys were made with two instruments  
a Junos-87 and Kellett-Ita-gamma  
ionization chamber, the two instruments  
agreed with surprising regularity in  
readings recorded.

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Locality Clusia - Bikini Date July 23, 1954 (cont)  
 Personnel \_\_\_\_\_ Weather \_\_\_\_\_  
 \_\_\_\_\_ Water conditions \_\_\_\_\_

Radiation level(s) \_\_\_\_\_

Operations:

Readings were made in two positions  
 1st at 3' and then at 1" with the shields  
 open. Readings were as follows:

Location	3' gamma	1" gamma + beta
Beach at high tide line	30 m/hr	45 m/hr
50' in from the beach	42 "	70 "
Low spot near beach	73 "	360 "
Coconut stump	40 "	220 "
Middle of island	25 "	60 "
North side of island	20 "	80 "
North side in debris	20 "	180 "
North side in intertidal zone	8 "	60 "
Reef flat at low tide	7 "	4 "
Spots on reef flat	20 "	400 "

Collection of plants were made on the island. New growths of arrow-root gave the island a green cast from the air. At the ground the plants appearing and appeared looked like a low bush ferns. Radiation readings were made at the locations where plants were collected and recorded with the plant data on the cards.

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Locality

Elmer + Bikini

Date

July 23, 1954 (cont)

Personnel

Weather

Water conditions

Radiation level(s)

Operations:

Birds were numerous and 3 fairy and 2 noddy Terns were shot for samples.

Collections of invertebrates were attempted on both the outer and inner reef areas with out success. Coral, clams, snails etc were either killed or smothered by the sand that covered most of the water areas.

Algae were almost absent - except for a slight green filamentous algae that grew in a small (10-12 ft) masses. I have algae, Rhizoclema, etc. # 69163 secured. The same was found near the target area at Elmer.

Fish were collected by putting out the poison on the edge of the broken rock on the lagoon side. Tide was receding and carried the poison along the beach, resulting in a big kill. Most of the fish killed, however, were small specimens, and some of a new stock that were repopulating the reef following the tests.

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Locality Clmes Date July, 24, 1954 (Sat)  
 Personnel Lovorn, Pantze, Melander, & Donaldson Weather Overcast 78°F min. 94°F max  
 Water conditions \_\_\_\_\_

Radiation level(s) 50 %/m

## Operations:

Worked at 213 on material gathered in previous days.

Pantze cleaned and oiled motor, and fittings on the rubber boats. Bradley and Pantze fished in the P.M. caught a shark and the rubber boat on the same hook.

Went to A.F.C. and looked at photo of the islands and maps for making aerial maps of the Atoll. Found photos may be removed for making copies for subsequent map construction.

Monitored the air and surface water at the Laboratory. The official list included Mr. John K. Karpis who came to see about the repair of the air compressor. Mr. R. Peterson, personal H.N., Bob T. left and Bill Peterson came to talk instrumentation and the keeping of the records of radiation exposure.

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Locality Elmer Date July 25, 1957 (Sunday)  
 Personnel Pautzke, Melander Weather Fair 80°F min. 95°F max  
Donaldson & Lowman Water conditions Smooth

Radiation level(s) 51 c/m background

## Operations:

Decay curves were brought up to date.

The gas analyzer and aluminum filters arrived from the laboratory.

Directions of material and its processing from the Bikini collection continued.

A new bird - rat series starting with 13,001 - 14,000 was started.

Pautzke moved into the outboard motor and worked on it for future use.

The council party on Col Ed Lehti was held at sunset during the evening hours.

al - mild surface, some more punch cards.

J.P.K.

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Locality Clomer Date July 26, 1954 (mon)  
Personnel Donaldson, Lawson Weather Hot  
Pautyke & Welandor Water conditions \_\_\_\_\_

Radiation level(s) \_\_\_\_\_

Operations:

Finished processing, sealing and packing samples collected to date. Includes samples from Bikini, the circuit tour and the weekly sample at Belle as follows:

- Fish: No. 12261 - 12555 inclusive
- Plants: " 6905 - 6999 "
- " " 10001 - 10023 "
- Rats & Birds " 9578 - 9607 "
- " " " 9680 - 9690 "
- Soils " 9774 - 9790 "
- Invertebrates " 11084 - 11188 "

Mr. Ernest Wanklyn and Mr. John Kyrosopoulos visited the laboratory. Mr. Wanklyn is interested in developing a display of marine life for the enjoyment and information of the general public. We promised to help in collection and identification of the specimens used.

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Locality Clam & Brimble Ridge Date July 27, 1954 (Tue)  
 Personnel Lawman, Poutyke Weather Shower -  
W. Menden & Donaldson Water conditions smooth

Radiation level(s)

## Operations:

Clamton tow of Brimble Ridge were carried out today by Donaldson, Poutyke & Menden in a 14' m "m" boat.

Collection was made at the following stations for 15 minutes with #6 and #20 ni

1. Wide Passage	8 <sup>55</sup> am - 9 <sup>10</sup> am	Temp. 83°F
2. N.E. of Lerry	10 <sup>40</sup> " - 10 <sup>55</sup> "	" 84°F
3. S. of Belle	12 <sup>15</sup> pm - 12 <sup>30</sup> pm	" 85°F
4. W. of Vera	1 <sup>54</sup> " - 2 <sup>09</sup> "	" 82°F
5. Deep Passage	3 <sup>37</sup> " - 3 <sup>52</sup> "	" 82°F

Trolling from the stern of the "m" boat three fish were taken a *Stenopus*, a 2 lined wrackhead and a *Paroto* (Little tuna).

Lawman worked on decay curves, packaged birds in the A.M., and had Tumor removed from forehead in the P.M.

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Locality Elmer and Janet Date July 28, 1954  
Personnel Pantzke, Melander Weather Fair 78° min 94° max  
Ronaldson & Lawrence Water conditions smooth

Radiation level(s) 48 c/pm 6 kg at Elmer Lab.

Operations:

Rats were collected on Janet by Pantzke and Ronaldson. A total of five (5) were shot. A number of rats were seen and could have been taken. The technique of walking slowly along the grassy places and driving the rats into the open areas for a shot seemed to work very effectively. Melander processed fish and packed material.

Lawrence worked on the day covers.

A conference was held with Mr. Ernest W. Sprague and Mr. John Kyrosopulu on our program. The scope and interests of the program were outlined and the need for support stressed. Transportation to the north end of the atoll on an as needed basis was promised and transport to Bikini and Rongerik on an as needed and available basis was promised.

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Locality Clouse and Belle Date July 29, 1954  
Personnel McLander, Donaldson Weather \_\_\_\_\_  
Lawson & Pantyge Water conditions \_\_\_\_\_

Radiation level(s) \_\_\_\_\_

Operations:

Packaged the birds collected at Fox  
on July 23, for transfer to A.F.L.

Birds & rates # 9697 - 9700 - 4  
" " # 7395 - 7430 - 36

McLander and Donaldson made  
weekly collections at Belle &

Donaldson & Pantyge had a rd farewell at 1300  
& left for Watch on the boat by way of the  
fourth to the land of the long pants & nesties,  
(and no steaks or Sat. date).

Dear in agreement with the statements made in  
your letter of the 2nd of July to Lawson but, the  
letter of July 22 to Bert the change of emphasis from  
counting to calculate ~~might not~~ should not be  
carried to far. ~~to far~~ We feel that, in view of the  
different day codes & different isotopes being selected  
by certain means, the shorter the time between  
collection and shipping the better will be the data.

This is not too clear but blame it on the flies.  
I killed 7 from beginning to end of paragraph most  
of them on me.

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Locality Elmer Date July 30, 1954  
 Personnel Lowman & W. Clouder Weather Hot - High 96°F  
9 boat w/ 47 c/m Water conditions good - calm.

Radiation level(s) 47 c/m bkq.

## Operations:

If the samples of B. hirs plankton from the July 23 collection are large enough a chemical separation should be made. The absorption curve is very different from anything else we've examined here. A decay curve is being done on the sample we have at the Perry lab.

Processed Belle samples, finishing all but the Claw by evening.

Adams busy getting ready to leave.

All: The plankton cups do not fit over the nets we have here as screens may have been substituted. The buckets do not fit on the old central frame since the nets 1 on 1/2 in. - 1/2 in. bucket has a different screen. So far we do all right with the old type but may need new cod ends soon.

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Locality E Inver Date July 31, 1954  
Personnel Lorenson + Wickander Weather Overcast to Fair  
Temp. 82 - 94°F Water conditions \_\_\_\_\_

Radiation level(s) 47 c/w. Bkg

Operations:

Finished processing Bella samples.  
Odenus finished feeding + cleaned up in surprising style. They + most of the flies have left for the deep south.  
Started to consolidate all Applied Fisheries property into 2 lockers. Could do it easily, except for surplus clothes of 2x members of Program 19 so left some of same overflow other lockers on the top shelf.

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Locality Elmer Date Aug 1, 1954 (Sunday)  
Personnel Lawman & Welander Weather Fine  
Water conditions Fine

Radiation level(s)

Operations:

Compressor has had rings replaced & Dr. Chavett & Welander tried out the air (Lawman not able wear a face mask over his operation as yet) in the aquariums in 20' of water. Stayed down 45 minutes with no great stress. Oil has been reduced considerably & what remains may be residual in the lungs themselves. We will get about clearing the lungs soon.

We discussed observation studies at Edna, Daisy & Belle & would like comments from the Club. One thought at present is to carefully note invasion of the harbor. Data on Edna & Daisy had enormous) of the different species from week to week. It may be that we should restrict ourselves to one of these 2 (presumably Edna) & note progress there. We need to have some idea of what to look for, in addition to above. We will add as much to the map of these islands (physical data) as we can.

Welander went out to the fishing traps & watched the sportmen catch fish. Brought 10 fishes back for sampling. Very little else caught.

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[Note Aug 2, on next page]

Locality Edna Date Aug 3 1954  
Personnel Loveman + Melander Weather Pl. calm. No wind  
Water conditions Flat calm.

Radiation level(s) 47-50 c/m at Edna lab

Operations:

Left 0500 for Edna, taking Mr William Bradley along. Saw numerous rays (String Rays & Eagle rays) along the reef & large sharks from the helicopter. Landed on Edna & walked around the island. The tide was high & water noticeably turbid on the lagoon side of the island & the area presumed to be very much silted over.

Many fish seen on the other side (reefward) of the island and some of these were poached. Examination of these indicated new forms not seen previously at Edna.

The shark population appears to be much larger but attempts to spear, shoot, poison or ~~trap~~ stings on them were fruitless & we are sharkless.

In addition to the small sharks (12-14") seen previously, one 4' shark was

Victors: Bob Taft, <sup>seen today</sup> ~~seen today~~

More crabs are being found at Edna with each visit. Crabs 1 1/2 - 2" across were seen for the first time. They are light gray with a rectangular shaped pinna and burrow into the sledge of the bottom in the shallow water. During the time we were at Edna 0830-1115 9 fairy terns and 4 noddys were seen over and around the island.

Today we were given a walkie-talkie for emergency communication. It will reach marine operations from any ~~area in the Atoll.~~

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Aug 3rd on preceding page

Locality

E. Entrance

Date

Aug. 2, 1954

Personnel

Lawman, Deland

Weather

Rain - lots of it

Water conditions

Rough

Radiation level(s)

4.7-5.0 c/m at E. Entrance Lab.

## Operations:

Worked in the lab all day. Had several visitors among them Dr. W. W. Hooper, J. Kavinopolis, Bob Talt, etc.

Cleaned up the lab - it now has a distinctive shine to it.

Began to process the fish from the barge in addition to other fish (3 sharks) taken by Bradley in Deep Entrance. Dr. Tharnell brought in 3 more caught in his crates out into Deep Entrance at low tide from the North end of Passy. Let them rot well we need take only the muscle from time appearing in the west part or we will be shocked when with samples.

Have found a boat for trawling Deep Entrance through the cooperation of Bob Talt is intended to use it Wednesday morning with the aut. beam meter. It is a 12 foot fiberglass boat of wide beam, slightly radioactive (30 mR) which Bob will keep condemned as long as we need it.

Counters not behaving correctly so Lawman picked up 6S17 tubes + replaced in the first amplifier stage. This cured the trouble.

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Locality Elmer Date Aug 4, 1954  
Personnel Lorenson & Welander Weather Calms, no breeze - light storm developed in morning  
Water conditions flat

Radiation level(s)

Operations:

Morning with wind from SE with heavy overcast. Left  
Wendler & Goodley called off fishing traps. Left not anxious  
to risk the boat in this weather. By noon weather  
was dead calm & it cleared.

Lorenson & Welander worked in lab all day. Processed  
some fish caught by Goodley & Tharrett off reef at  
North end of Island in Deep Entrance.

Mr. Burgess came down & discussed several  
plant & animal exhibit which is to be set up in  
Recreation hall.

Mr. Butler & Tall came down in afternoon & discussed  
the exhibit in the lab & laboratory traps in Deep Entrance  
& on the outer reef of Elmer. We have plotted a number  
of specimens & will count them as soon as the  
counters stop their meandering.

Frank still trying to solve the counter problem.  
Both counters remain unreliable.

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Locality Elmer Date Aug. 5, 1954  
Personnel Lawman & Welander Weather Wind 3 knots - westerly, clear.  
Water conditions smooth

Radiation level(s) Belle 8-3' 5 m/hr for 1" 24 m/hr - lower area background is dismal.

Operations: Major collection trip to Belle 0800 to 1500 with Lawman, Welander, Taft & Fletcher.

Experienced difficulty in finding all the algae & invertebrates required in Areas A & F. Much of the coral & most of the sponges are dead in these areas. What algae (i.e. cauleya) remains appears to be short (decayed by fish?) & in out of the way places. Halimeda is abundant. Microdictyon found in only one area & one place. Dictyota found only in area F abundantly. A few isolated "leaves" seen in area F - not enough to make a sample. Other invertebrates abundant.

Fish haul was adequate. Prisoner net in deep pool along inside edge of Belle beach enclosure & along the littoral to the seaward end of pool.

Only one branch of red gorgonian seen in collecting place. However, under the bushes east of area A along the beach 5 very large specimens were found. Two were retained and the other three transported to the hole where the collections are usually made.

The T. cyan specimens are fairly abundant - about 300 yards out in the outer reef but this is far north of Areas G and H.

Plenty of fairy terns are available but the noddys avoid us like poison.

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Locality Edna - Date Aug 6 1954  
Personnel Welander & Lowman Weather fair  
Water conditions smooth (no wind)

Radiation level(s) Counter still kaput

Operations:

Processed part of fish, plants, algae, and ctenophore from Aug. 5 collection. Made contact prints of aerial shots taken July 14 of Edna and the surrounding area.

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Locality Elmer Date Aug 7, 1954

Personnel W. W. W. W. W. Weather Clear

Water conditions good

Radiation level(s) no count. Counter not working

Operations:

Processing Marine collection from Belle (Aug 5)  
Finished processing on fish, invertebrates  
& birds.

Went out in afternoon with a sea-ling to  
20 feet depth. Present were Johnson, Dr. Frank  
Sherret, Mr. William Bradley & W. W. W.

Air has some oil, probably residue from  
the tanks, not enough to cause nausea or  
discomfort.

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SEATTLE, WASHINGTON

Locality S. Linn Date Aug 9, 1954 (Monday)  
Personnel J. Linn Weather Fair - 16.1  
Water conditions Wind 1 knots ENE

Radiation level(s)

Operations:

Packaged Belle collection  
found a few 20 pieces of a mistake  
A+U

Welded tried to patch leader in rubber  
boat (3.5 ft. for), patching would not hold.

Please send the 15" Telephoto lens which Frank  
modified to fit the Speed Graphic camera.

Is there any word on the Fyler net? Personally see  
no point in starting to use it at this late date  
but will do so if it comes. AW.

Is there any word on the aqua lung tools which  
are to be made by the machine shop?

A: We received all of the material in your letter of Aug.  
3rd, but the frames for the color pictures are of the  
wrong dimensions. We need the square type for the Robot  
camera shots (Ed. should know about these). Rest of  
shipment O.K.

Keep your ammunition dry for the arguments on  
the absorption curves.

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Locality Edna Date Aug 10, 1954  
 Personnel Turner + Welton Weather Hot Clear  
 Water conditions 10 knot wind

Radiation level(s)

Operations:

Left Edna for Clara. Tide low 1830

Note!  
 1 Small  
 about 24 inch  
 from Edna  
 to Clara



Water line shows approx. path of observation on inner reef of a fall from Edna to Clara.  
 ← Reef shelf  
 ← Water level 1 crown fin fish (first type). Off Edna particularly many rock covered with algae (*Rhizoclonium*), *Lobelia* etc. reef shelf; replaced by sparse grassy reef shelf.  
 ← Looking for crown fin. A pair of fish were singly abundant toward Clara, in shore end of shore.  
 ← Not the same as here. Abundant from here to Clara.  
 Small corals seen around Edna and down the reef.  
 ← Small sea urchins seen here. No out shells, small, all small except 1 sea urchin (2" across).  
 Atlantic low swim fin here. Apparently fin drifted approximately parallel to reef all the way to Clara.  
 Plants on Clara: *Mesocarpus*, *Sarcocolla*, *Portulaca* (many sickly looking but plants abundant) *Lepturus* + *Mutroda* (one small plant).

One or more Ears signs under every dead fish skeleton on Edna.  
 Fish off Edna: Mussel (*A. bivalvatus*), wrasse (*H. trimaculatus*), snapper (*G. vaigranii*), Mullet, surgeon (*A. triostegus*), Shark (*C. melanopterus*), 1 large (*C. coron*) sting ray; Bullhead fish, goat fish. Fish less abundant between north end of Daisy to Clara than off Edna.  
 Left Edna 1500. well done by the sun.

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