LAGOON BOTTOM SAMPLES

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GROSS BETA RADIOACTIVITY OF BOTTOM SAMPLES FROM RONGELAP LAGOON IN AUGUST 1958

by

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Gross beta radioactivity of bottom samples from Rongelap Lagoon in August 1958.

In August 1958, bottom samples were obtained from ten plankton-collecting stations in the southern and eastern regions of Rongelap Lagoon (Figure 1). At the first nine stations ship's personnel of the support vessel, LSM "Alsto", used brown soap in the depression in the lower end of the sounding lead to get small amounts of sand and other bottom materials that would adhere and could be scraped off with a knife. The process was usually repeated more than once at each station. At station 10 the anchor brought up several pounds of the bottom so that samples were taken from both the hinge of the anchor, which was considered to have been at about surface level on the bottom, and from the flukes which were estimated by both ship-and laboratory-personnel to have been about two feet below the surface of the bottom.

At Seattle the samples were ashed, and ~~radio assayed~~ counted in methane flow counters with the results shown in Table 1 and Figure 2. Sample values ranged from .051 to .28, with a geometric mean of .089 uc/kg of ash. Ashing changed wet sample weight by an average factor of 0.47, which included the natural organic matter and the soap. The soap contained 21% ash.

The highest concentrations of activity occurred at Stations 5 and 6, north and west of Eniaetok Island. The samples from the anchor at Station 10 showed that the radioactivity was not confined to the top inch or so of the bottom material, but suggested that it penetrated to a depth of at least two feet in only slightly reduced degree.

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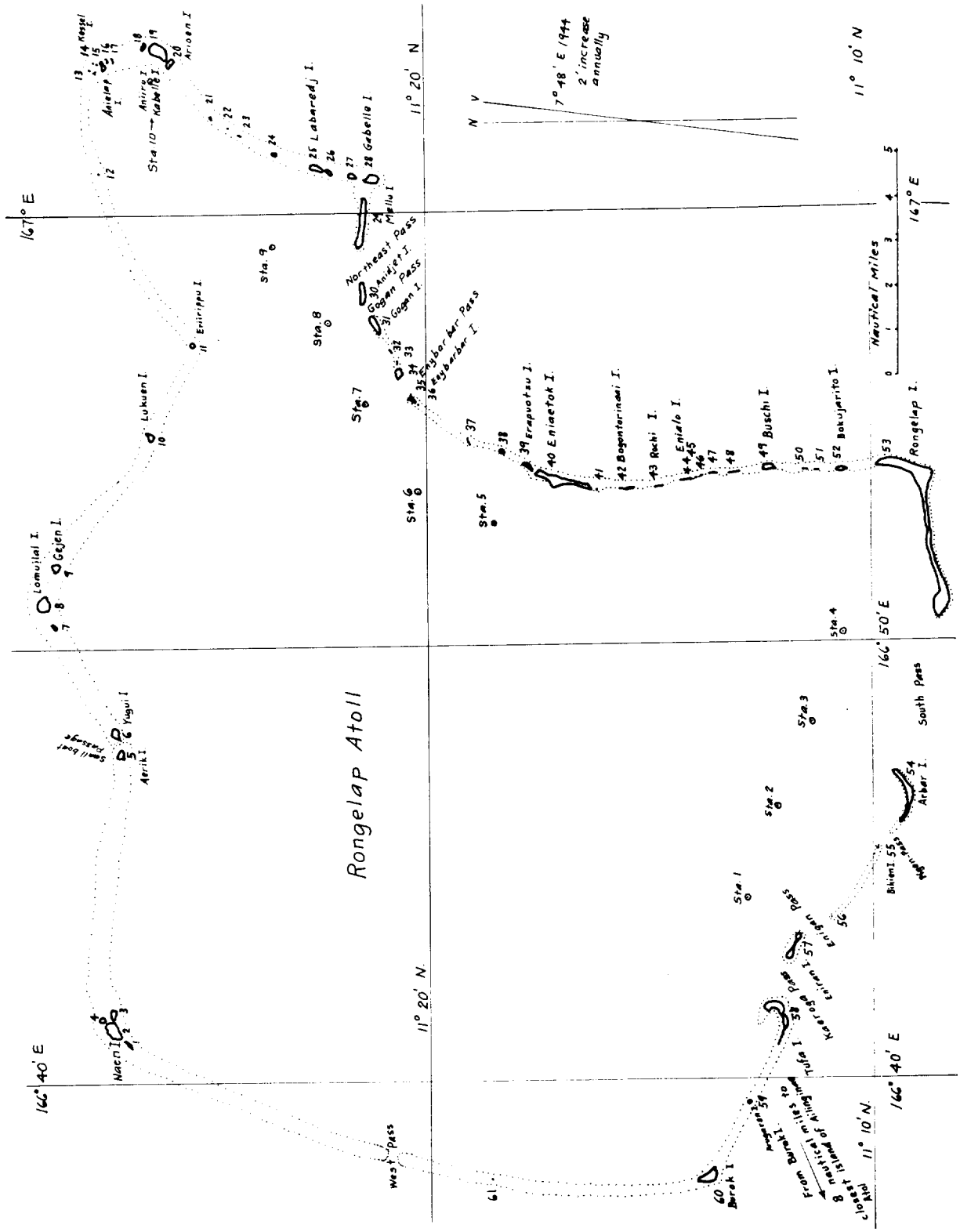

Figure 1. Map of Rongelap Atoll showing locations of ten plankton- and bottom-sampling stations in the southern and eastern portions.

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Table 1. Bottom samples, in August 1958 from Rongelap Lagoon plankton collecting stations - collecting, processing, and results of beta counting with methane flow.

Station Number	Date of collection	Locality	Depth in fathoms	Weight in grams: Entire sample including soap, Wet	Weight in grams: Entire sample including soap, Dry	Weight in grams: Portion plated, Ash	μc/kg of ash
1	15	2 mi. N Enigan Pass	25	11.0	7.69	1.726	.062
2	15	3 mi. N Pigen Pass	25	6.4	3.82	2.257	.051
3	15	3 mi. N South Pass	27	7.4	4.64	2.051	.058
4	15	3 mi. N South Pass	20	12.4	8.28	2.660	.066
5	19	1½ mi. NW Eniaetok I.	33	7.0	3.42	1.243	.23
6	19	2 mi. W Enybarbar I.	30	5.4	2.21	1.149	.28
7	19	1 mi. N Enybarbar I.	23	11.0	7.06	2.710	.070
8	19	1 mi. N Gogan I.	23	10.4	7.25	2.763	.098
9	19	2 mi. N Mellu I.	29	6.4	3.72	1.928	.130
10	23	2/3 mi. W Kabelle I.	11	7.2*	5.20*	1.657	.072
2 feet below Sta. 10	23	" " " " "	"	7.5*	5.47*	2.206	.052

*Samples taken from anchor; include no soap.

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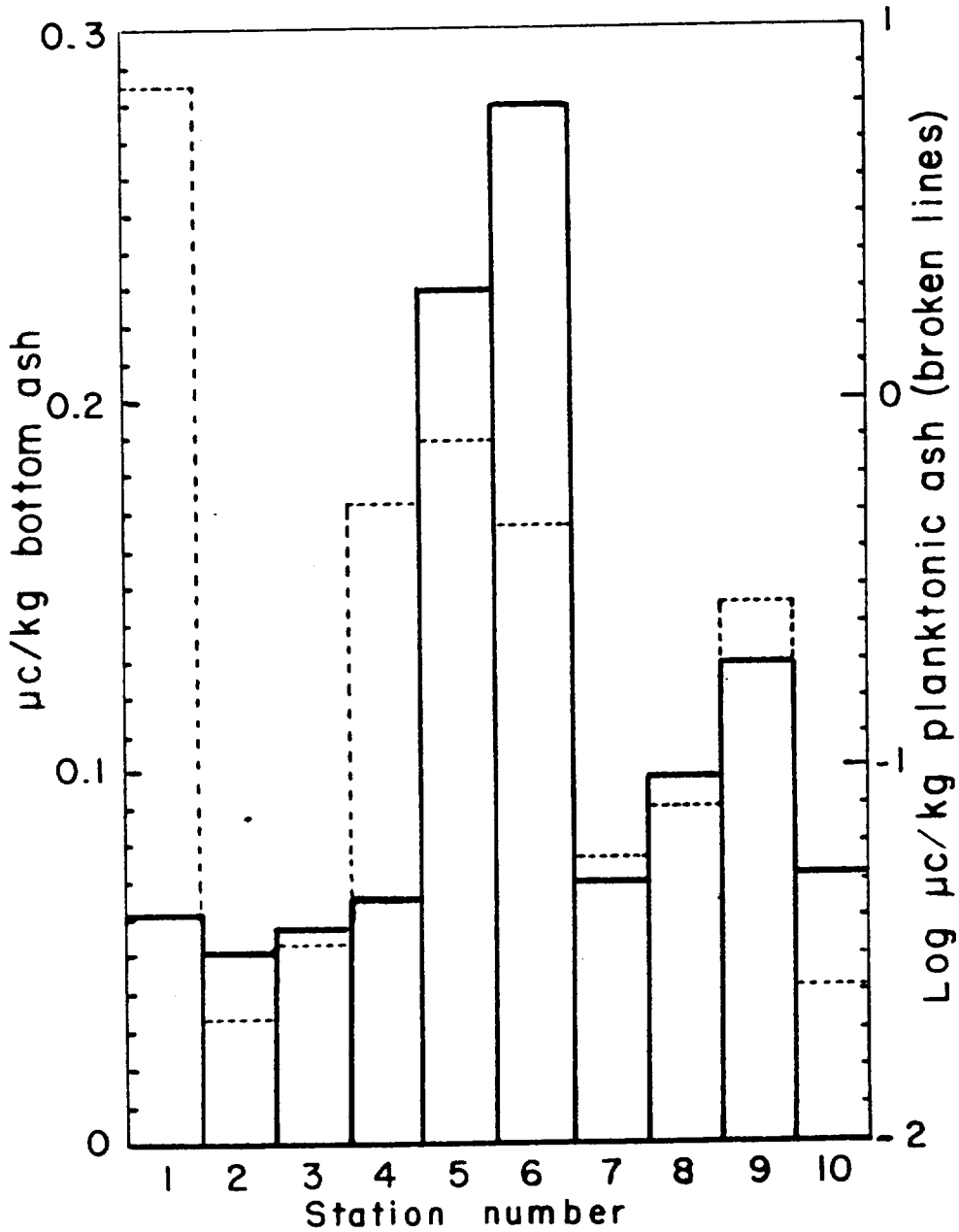

Figure 2. Histogram showing beta-activity of ashed samples of bottom material and pumped plankton from ten stations at Rongelap Atoll in August 1958.

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No information is available on the radioactivity of lagoon bottom material deeper than two feet, but from the slight decrease thus indicated at two feet, the activity may be assumed to have penetrated farther, constituting a reservoir estimated to exceed 20,000 curies of beta activity in the first meter of lagoon bottom in August 1958. This may be compared to 54,000 curies estimated (UWFL-43:54) for the top 8 inches in 1955.

Plankton values might be expected to correlate with bottom sample values (Figure 2). In a comparison of activity at the ten stations between pumped plankton and bottom samples the positive correlation coefficient fell somewhat short of statistical significance, even omitting the first station involving an exceptionally high plankton value. However, values for plankton tows near Rongelap Island, Eniaetok Island, and Kabelle Island were negatively related (non-significantly) to the values for bottom samples at the corresponding localities, respectively at stations 3 and 4, 5, and 10. Thus, there is no evidence of correlation between radioactivity of plankton and of bottom samples at the same locality.

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REFERENCE

Applied Fisheries Laboratory, University of Washington 1955.
Radiobiological resurvey of Rongelap and Ailinginae Atolls, Marshall Islands, October-November, 1955. U.S. Atomic Energy Commission report UWFL-13.

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