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U.S. PROGRAM IN BIOLOGY

INTERNATIONAL INDIAN OCEAN EXPEDITION

FINAL CRUISE REPORT
ANTON BRUUN CRUISE 2

OCEANOGRAPHIC DATA

BATHYTHERMOGRAPH POSITIONS

STATION LISTS for BIOLOGICAL COLLECTIONS

INTERNATIONAL INDIAN OCEAN EXPEDITION

Woods Hole Oceanographic Institution
ATLAS - GAZETTEER COLLECTION

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JULY, 1964

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Cruise 2

U. S. PROGRAM IN BIOLOGY

INTERNATIONAL INDIAN OCEAN EXPEDITION

Final Report: R/V ANTON BRUUN, Cruise 2

Cruise 2 of the R/V ANTON BRUUN took place in the western Indian Ocean from May 22 to July 23, 1964. The following report presents the station lists for plankton collections, bathythermograph positions, and reduced oceanographic, chemical, and biological data for Cruise 2. The cruise track is shown in Figure 1, and the itinerary with ports of call is given in Table 1.

A summary of the types of scientific activities carried out during the cruise, and a list of the techniques employed are given in Tables 2 and 3, respectively. In addition to the basic hydrographic and biological programs and the researches of individual scientists, a special program of long-line fishing was carried out in a cooperative effort with the U. S. Bureau of Commercial Fisheries. Details regarding the composition of the long-line catches and associated data are on file at the Biological Laboratory; Bureau of Commercial Fisheries; U. S. Fish and Wildlife Service, Honolulu, Hawaii.

A narrative report of Cruise 2, including a list of participants and brief descriptions of their research interests and preliminary results, was issued as New Bulletin No. 3 of the U. S. Program in Biology, IIOE, dated January, 1964.

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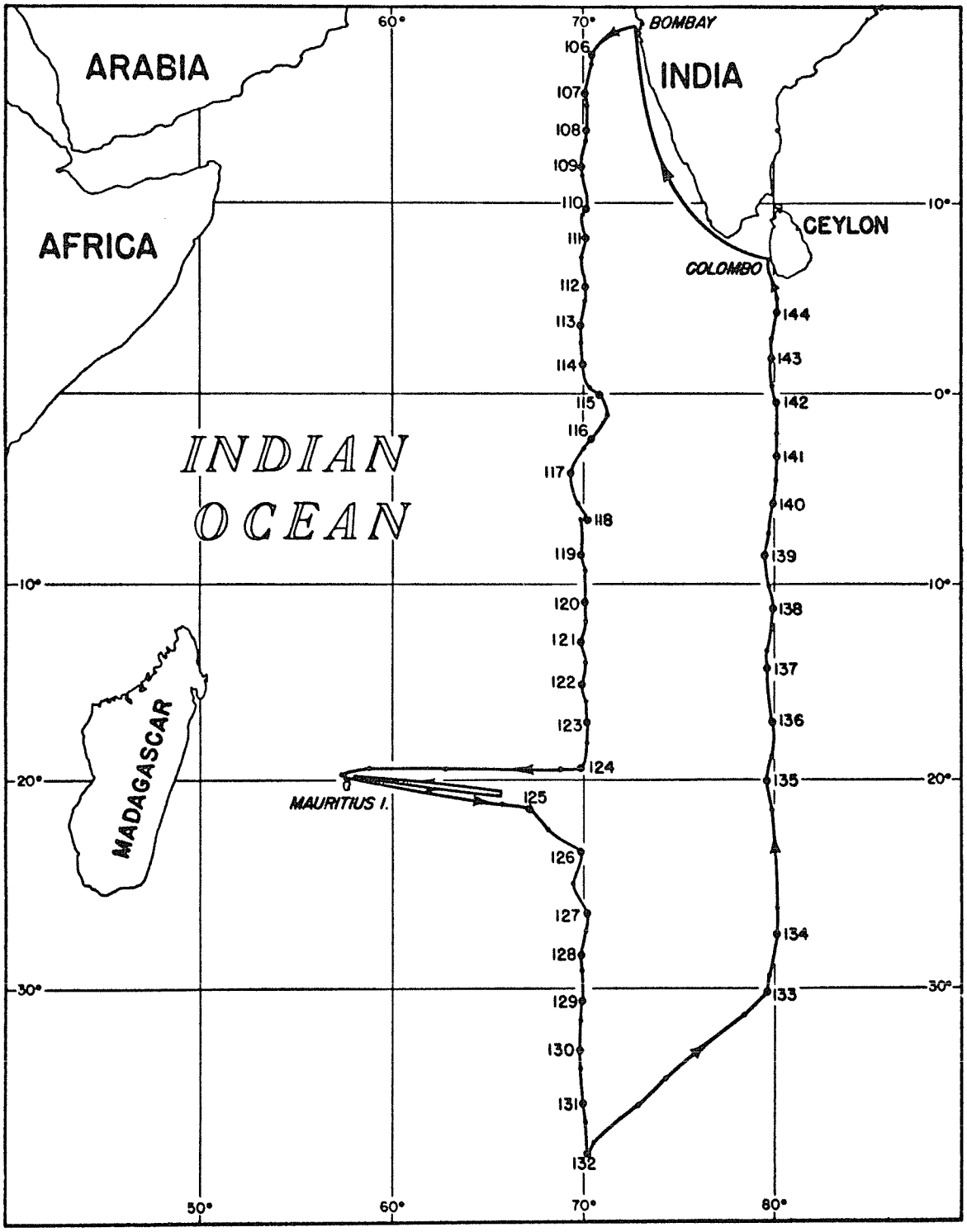
Table 1. Itinerary, Cruise 2, R/V ANTON BRUUN

May 22, 1963	Departed Bombay, India.
May 22 - June 11	Completed series of stations from 17° N. to 20° S. latitude along 70° E. longitude.
June 14	Arrived Port Louis, Mauritius (fuel and provisions).
June 18	Departed Port Louis.
June 22	Returned Port Louis (emergency call, appendicitis case on board).
June 22	Departed Port Louis.
June 25 - July 2	Completed series of stations from 22° S. to 37° S. latitude along 70°E. longitude.
July 5 - July 17	Completed series of stations from 30° S. to 4° N. latitude along 80° E. longitude.
July 18	Arrived Colombo, Ceylon (fuel and provisions).
July 19	Departed Colombo.
July 23	Arrived Bombay, - end of Cruise 2.



Track Chart of the ANTON BRUUN, Cruise 2, May 22 - July 23, 1963

FIGURE 1

Table 2. Summary of Activities, Cruise 2, R/V ANTON BRUUN

Station	Date	Latitude	Longitude	Long Line	Hydro Cast	Prim. Prod.	Plankton Tows 75M25	IOSN	Be-3	M-O	75M3
106	5/23	17°37'N	70°27'E	x	x	x	x	x	x		
106A	5/23	17°04'N	70°23'E							x	
107	5/24	15°40'N	70°07'E	x	x	x	x	x	x		
107A	5/24	15°01'N	70°09'E							x	
108	5/25	13°50'N	70°07'E	x	x	x	x	x	x		
108A	5/25	13°15'N	70°03'E							x	
109	5/26	11°59'N	69°55'E	x	x	x	x	x	x		
109A	5/26	11°28'N	69°56'E							x	
110	5/27	09°46'N	70°06'E	x	x	x	x	x	x		
110A	5/27	09°26'N	69°59'E							x	
111	5/28	08°09'N	70°02'E	x	x	x	x	x	x		
111A	5/28	07°08'N	69°57'E							x	
112	5/29	05°48'N	70°03'E	x	x	x	x	x	x		
112A	5/29	04°58'N	70°01'E							x	
113	5/30	03°33'N	69°54'E	x	x	x	x	x	x		
113A	5/30	02°46'N	69°54'E							x	
114	5/31	01°30'N	70°01'E	x	x	x	x	x	x		
114A	5/31	01°16'N	70°20'E							x	
115	6/1	01°07'S	71°00'E	x	x	x	x	x	x		
115A	6/1	01°10'S	71°08'E							x	
116	6/2	02°23'S	70°24'E	x	x	x	x	x	x		
116A	6/2	02°57'S	70°00'E							x	
117	6/3	04°22'S	69°24'E		x	x	x	x	x		
117A	6/3	05°54'S	69°47'E							x	
118	6/4	06°48'S	70°07'E		x	x	x	x			
118A	6/4	06°37'S	70°09'E							x	
118B	6/5	06°45'S	69°41'E	x							
119	6/6	08°35'S	69°55'E	x	x	x					
119A	6/6	09°26'S	70°03'E							x	
120	6/7	11°10'S	70°02'E		x	x		x	x		
120A	6/7	12°04'S	70°02'E							x	
121	6/8	13°15'S	69°51'E	x	x	x	x	x			x
121A	6/8	14°14'S	70°02'E							x	
122	6/9	15°25'S	69°58'E	x	x	x	x	x	x		
122A	6/9	16°08'S	70°02'E							x	
123	6/10	17°18'S	70°05'E	x	x	x	x	x	x		
123A	6/10	18°12'S	70°04'E							x	
124	6/11	19°30'S	69°51'E	x	x	x	x	x	x		
124A	6/11	19°32'S	68°46'E							x	
124B	6/12	19°30'S	63°50'E							x	
124C	6/13	19°27'S	58°51'E							x	
124D	6/14	19°47'S	57°28'E								
124E	6/14	19°54'S	57°36'E								

Table 2. (Page 2)

Station	Date	Latitude	Longitude	Long Line	Hydro Cast	Prim. Prod.	Plankton Tows 75M25	IOSN	Be-3	M-O	75M3
124F	6/24	21°21'S	65°52'E							x	
125	6/25	21°40'S	67°06'E	x	x	x	x	x			x
125A	6/25	22°37'S	68°04'E							x	
126	6/26	23°47'S	69°05'E	x	x	x	x	x	x		
126A	6/26	25°01'S	69°30'E							x	
127	6/27	26°34'S	70°12'E	x	x	x	x	x	x		
127A	6/27	27°23'S	70°04'E							x	
128	6/28	28°33'S	69°58'E	x	x	x		x			x
128A	6/28	29°11'S	69°57'E							x	
129	6/29	30°34'S	69°55'E	x	x	x	x	x	x		
129A	6/29	31°28'S	69°52'E							x	
130	6/30	32°52'S	69°52'E	x	x	x	x	x	x		
130A	6/30	33°42'S	69°56'E							x	
131	7/1	35°09'S	69°59'E	x	x	x	x	x	x		
131A	7/1	35°57'S	70°04'E							x	
132	7/2	37°12'S	70°10'E	x	x	x	x	x	x		
132A	7/2	36°52'S	70°39'E							x	
132B	7/3	35°17'S	72°55'E						x		
132C	7/3	34°06'S	74°26'E							x	
132D	7/4	31°08'S	78°28'E							x	
133	7/5	30°11'S	79°42'E	x	x	x	x	x	x		
133A	7/5	29°24'S	79°48'E							x	
134	7/6	27°31'S	80°08'E		x	x	x	x	x		
134A	7/6	26°17'S	80°10'E							x	
134B	7/7	21°37'S	79°55'E							x	
135	7/8	20°02'S	79°50'E	x	x	x	x	x	x		
135A	7/8	18°59'S	79°53'E							x	
136	7/9	17°14'S	79°52'E		x			x	x		
137	7/10	14°44'S	79°44'E	x	x	x		x			x
137A	7/10	13°40'S	79°48'E							x	
138	7/11	11°28'S	80°00'E		x	x		x			x
138A	7/11	10°08'S	79°48'E							x	
139	7/12	08°37'S	79°34'E	x	x	x		x			x
139A	7/12	07°24'S	79°42'E							x	
140	7/13	05°53'S	79°57'E		x	x	x	x	x		
140A	7/13	04°41'S	80°01'E							x	
141	7/14	03°13'S	80°02'E	x	x	x	x	x			x
141A	7/14	02°03'S	80°08'E							x	
142	7/15	00°33'S	80°08'E	x	x	x	x	x			x
142A	7/15	00°23'N	79°58'E							x	
143	7/16	01°54'N	79°52'E	x	x	x	x	x	x		
143A	7/16	02°51'N	79°53'E							x	
144	7/17	04°18'N	80°08'E	x	x	x	x	x	x		
144A	7/17	05°01'N	80°05'E							x	
144B	7/19									x	
144C	7/20									x	
144D	7/21									x	

Table 3. Methods and Techniques employed on Cruise 2 with references.

1. Navigation: Celestial navigation and dead reckoning. Corrected positions taken from smooth navigation plots.

2. Bottom depth: Precision Echo Sounder Recorder (Alpine Geophysical Assoc.). Note - Continuous records taken throughout Cruise 2 have been turned over to Dr. Bruce Heezen, Lamont Geological Observatory.

3. Bathythermograph observations: Taken on arrival at each station and at intervals of 1 hour or less between stations. Records deposited with National Oceanographic Data Center, Washington, D. C.

4. Temperature and depth: Paired protected and unprotected deep-sea reversing thermometers. Reliability of depth calculations shown on relative scale of 1 (high) - 3 (low).

5. Water samples
   a) Chemistry: Teflon-coated Nansen bottles (Balauf Mfg. Co., Washington, D.C.).

   b) Productivity and pigments: Large volume, all-plastic (lucite) water sampler designed by D.W. Menzel, Woods Hole Oceanographic Institution, Woods Hole, Mass.

6. Salinity: Inductance-type salinometer (Autolab Industries, Sydney, Australia).

7. Dissolved oxygen: Winkler method, biniodate standard.

8. Phosphate: Murphy, J. and J.P. Riley. 1962. A modified single solution method for the determination of phosphate in natural waters. Anal. Chim. Acta 27: 31-36.

9. Nitrite: Rider, B.F. and M.G. Mellon. 1946. Colorimetric determination of nitrites. Ind. Engin. Chem. Anal. Ed. 18: 96-99.

10. Nitrate: Mullen, J.B. and J.P. Riley. 1955. The spectrophotometric determination of nitrate in natural waters, with special reference to sea water. Anal. Chim. Acta. 12: 464-480.

11. Mullen, J.B. and J.P. Riley. 1955. The colorimetric determination of silicate with special reference to sea and natural waters. Ibid. 12: 162-175.

12. Plankton pigments:
    a) Richards, F.A. with T.G. Thompson. 1952. The estimation and characterization of plankton populations by pigment analysis. II. A spectrophotometric method for the estimation of plankton pigments. J. Mar. Res. 11: 156-172.

b) Creitz, G.I. and F.A. Richards. 1955. _____ III. A note on the use of "millipore" filters in the estimation of plankton pigments. Ibid. 14: 211-216.

c) Whatman GF/C glass fiber filters used in place of millipore filters.

d) Data for chlorophyll[a] only reported here. Optical densities of acetone extracts A/C Richards with Thompson may be obtained on request from J.H. Ryther, Woods Hole Oceanographic Institution, Woods Hole, Mass.

13. Primary production:

a) C-14-technique, basically as in: Steemann Nielsen, E. 1952. The use of radioactive carbon (C^{14}) for measuring organic production in the sea. J. Cons. Internat. Explor. Mer. 18: 117-140.

b) Millipore HA type membrane filters used throughout. Filters rinsed with 10 ml. 0.01 N HCl in 3% NaCl.

c) Simulated in situ measurements: Water samples collected from depths of penetration of 100, 50, 25, 10, and 1% incident light. Samples with C^{14} added incubated for 24 hours on deck in water cooled lucite cylinders covered with neutral density (wire mesh) filters to simulate in situ light intensities.

d) Artificially-illuminated measurements: Samples from same depths as in (c) incubated for 4 hours at approximately 1000 foot candles from fluorescent lamps.

e) Dark bottle C^{14} uptake subtracted from light bottle values for each depth and for both sets of measurements (c and d).

14. Incident Radiation: Eppley 50-junction pyrheliometer recorded on Leeds and Northrup Speedomax recorder. Records mechanically integrated with planimeter to give daily radiation. Radiation data refer to 24 hour period of simulated in situ productivity value (i.e. for 24 hours following arrival on station).

15. Biological sampling gear: See key immediately preceding station lists for biological collections.

16. Plankton displacement volume: Taken only for Indian Ocean Standard Net 200 m. vertical hauls. Volume measured on "squeeze-dried" plankton by displacement in volumetric cylinder.

17. Meteorological observations: Taken by member of International Indian Ocean Meteorology Programme. (Dr. Colin Ramage, Scientific Director).

REDUCED DATA

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STATION NO. 106
CRUISE NO. 2
VESSEL *R/V ANTON BRUUN*
DATE 23-V-63
RELIABILITY OF DEPTH

LAT. 17° 37' N
LONG. 70° 27' E
DEPTH 2820 M
TIME 1324
WIND

PRIMARY PROD. .09 g C /m²/day
EXT. COEFF. (k) 0.08
RADIATION 445 g.cal./cm²/day
ZOOPLANKTON VOL.
IOSN STD. TOW 6.9 ml./m.²

DEPTH	TEMP.	SAL. ‰	O_2 ml./l.	PO_4-P µgA/l.	NO_3-N µgA/l.	NO_2-N µgA/l.	SiO_3 Si µgA/l.		
1	29.92	35.078	4.66						
25	—	35.376	4.89						
50	28.35	36.011	5.12						
75	27.00	36.349	4.88						
100	25.76	36.349	4.10						
125	23.92	36.174	2.54						
150	21.50	35.936	1.03						
200	16.87	35.742	0.34						
299	13.75	35.637	0.28						
399	12.67	35.628	0.21						
499	11.82	35.574	0.32						
599	11.26	35.558	0.34						
699	10.39	35.485	0.27						
798	9.66	35.430	0.17						
898	9.09	35.399	0.24						
998	8.39	35.325	0.46						
988	8.52	35.343	0.35						
1187	7.04	35.177	0.65						
1386	5.80	35.067	0.86						
1686	4.15	34.929	1.75						
1986	2.17	34.835	2.36						

DEPTH	Chl. a µg/l.	INSITU C^{14} µgC/l./d.	C^{14}-1000 fc µgC/l./d.	
1	0.10	5.2	16.6	
9	0.20	0.7	11.6	
17	0.14	4.2	23.6	
29	0.09	0.9	10.6	
58	0.09	0.2	2.8	

REDUCED DATA

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STATION NO. 107
CRUISE NO. 2
VESSEL *R/V ANTON BRUUN*
DATE 24-V-63
RELIABILITY OF DEPTH

LAT. 15° 40' N
LONG. 70° 07' E
DEPTH 2500 M
TIME 1149
WIND

PRIMARY PROD. .09 g C /m²/day
EXT. COEFF. (k) 0.07
RADIATION 383 gcal./cm²/day
ZOOPLANKTON VOL.
IOSN STD. TOW 9.4 ml./m.²

DEPTH	TEMP.	SAL. ‰	O_2 ml./l.	PO_4-P µgA/l.	NO_3-N µgA/l.	NO_2-N µgA/l.	SiO_3 Si µgA/l.
1	30.52	35.358	4.83	u	0.3	0.03	2.2
25	30.09	35.322	4.84	0.01	0.3	0.03	2.5
50	27.88	36.089	5.00	0.13	0.2	0.01	2.5
74	25.18	36.264	2.71	0.79	7.7	0.09	6.0
99	22.46	35.985	1.01	1.45	16.0	u	9.4
124	20.44	35.810	0.39	1.80	18.5	0.05	16.3
149	18.52	35.652	0.30	2.07	18.2	1.35	21.3
198	15.89	35.599	0.34	2.08	16.7	2.52	25.2
298	13.53	35.585	0.27	2.31	18.7	1.88	34.3
397	12.17	35.511	0.22	2.34	22.0	0.04	36.0
496	11.49	35.483	0.16	2.54	22.4	0.06	43.9
595	11.03	35.487	0.18	2.42	20.6	0.03	46.6
694	10.38	35.449	0.17	2.49	25.2	0.03	49.7
794	9.71	35.425	0.21	2.58	27.2	0.02	56.9
893	9.02	35.372	0.18	2.69	26.2	0.05	55.8
992	8.26	35.294	0.28	2.58	33.4	0.02	69.5
994	8.26	35.295	0.46	---	---	---	--
1194	6.96	35.179	0.58	2.77	---	0.02	84.2
1394	5.66	35.065	0.84	2.95	31.7	0.02	104.9
1694	3.86	35.902	1.76	2.81	26.9	0.02	122.4
1994	2.90	34.825	2.35	2.70	30.2	0.02	134.3

DEPTH	Chl. a µg/l.	INSITU C^{14} µgC/l./d.	C^{14}-1000 fc µgC/l./d.
1	0.08	3.5	3.1
10	0.07	0.7	3.1
20	0.08	1.5	3.5
33	0.10	2.3	3.8
66	0.34	u	0.1

REDUCED DATA

U. S. PROGRAM IN BIOLOGY — INTERNATIONAL INDIAN OCEAN PROGRAM

STATION NO. 108
CRUISE NO. 2
VESSEL R/V ANTON BRUUN
DATE 25-V-63
RELIABILITY OF DEPTH

LAT. 13° 50' N
LONG. 70° 07' E
DEPTH 3710 M
TIME 1141
WIND

PRIMARY PROD. .03 g C /m²/day
EXT. COEFF. (k) 0.08
RADIATION 207 g.cal./cm.²/day
ZOOPLANKTON VOL.
IOSN STD. TOW 9.1 ml./m.²

DEPTH	TEMP.	SAL. ‰	O_2 ml./l.	PO_4-P µgA/l.	NO_3-N µgA/l.	NO_2-N µgA/l.	SiO_3 Si µgA/l.
1	30.37	34.774	5.11	0.09	0.1	u	2.0
25	29.88	35.406	5.12	0.19	0.4	0.01	2.6
50	28.18	35.527	5.65	0.22	0.5	u	2.6
75	27.19	35.880	5.13	0.28	0.5	u	2.4
100	26.57	36.369	4.44	0.49	2.8	0.41	1.9
124	23.52	35.930	2.21	1.27	22.1	0.29	7.6
149	21.10	35.700	0.96	1.82	29.8	0.50	13.1
199	17.36	35.524	0.40	2.26	32.1	2.87	23.4
299	13.94	35.480	0.22	2.28	35.3	0.84	32.0
398	12.51	35.480	0.18	2.52	38.9	0.13	36.8
498	11.99	35.540	0.27	2.59	36.6	0.27	43.5
597	11.29	35.535	0.32	2.65	39.7	0.38	48.1
697	10.17	35.408	0.28	2.78	42.6	0.37	59.4
797	9.71	35.418	0.26	2.78	45.4	1.04	65.6
896	8.78	35.329	0.30	2.84	44.6	0.47	71.9
996	7.79	35.213	0.57	2.89	44.9	0.02	81.3
1196	6.63	35.114	0.88	2.91	49.0	0.01	91.4
1396	5.48	35.034	1.08	2.83	46.5	0.04	100.3
1695	3.86	34.894	1.85	2.80	50.5	0.02	122.4
1995	2.86	34.820	2.41	2.72	45.8	0.02	130.6

DEPTH	Chl. a µg/l.	INSITU C^{14} µgC/l./d.	C^{14}-1000 fc µgC/l./d.
1	0.01	1.3	2.3
9	0.02	1.9	2.2
17	0.01	0.9	0.5
29	0.05	u	3.2
58	0.09	u	u

REDUCED DATA

U. S. PROGRAM IN BIOLOGY — INTERNATIONAL INDIAN OCEAN PROGRAM

STATION NO. 109
CRUISE NO. 2
VESSEL R/V ANTON BRUUN
DATE 26-V-63
RELIABILITY OF DEPTH

LAT. 11° 59' N
LONG. 69° 55' E
DEPTH 4300 M
TIME 1147
WIND

PRIMARY PROD. .05 g C /m²/day
EXT. COEFF. (k) 0.08
RADIATION 287 g.cal./cm²/day
ZOOPLANKTON VOL.
IOSN STD. TOW 4.9 ml./m.²

DEPTH	TEMP.	SAL. ‰	O_2 ml./l.	PO_4-P µgA/l.	NO_3-N µgA/l.	NO_2-N µgA/l.	SiO_3 Si µgA/l.
1	29.68	34.688	4.95	0.12	0.3	0.01	1.6
24	29.79	35.221	5.24	0.13	0.1	0.01	2.1
48	28.47	35.483	5.29	0.17	1.3	0.03	2.0
72	27.27	36.019	5.25	0.26	--	u	2.5
96	25.02	36.074	3.43	0.79	7.4	0.21	4.2
120	22.08	35.800	1.04	1.65	21.0	0.10	11.7
144	19.12	35.511	0.68	2.01	24.5	0.12	17.4
192	15.91	35.345	0.58	2.25	20.6	0.02	25.3
288	13.24	35.359	0.34	2.34	22.4	0.02	28.7
386	12.07	35.371	0.45	2.48	23.3	0.06	36.2
484	11.55	35.417	0.26	2.53	29.7	0.01	44.7
583	10.94	35.413	0.17	2.70	26.8	0.05	47.8
682	10.02	35.339	0.20	2.70	29.9	0.22	56.2
782	9.23	35.285	0.28	2.78	25.6	0.01	64.8
882	8.63	35.278	0.39	2.89	27.4	0.01	71.3
992	7.78	35.203	0.50	2.95	28.6	0.01	79.9
992	7.68	35.175	0.52	2.91	28.5	u	81.3
1191	6.39	35.085	0.84	2.95	28.6	u	91.5
1390	5.15	34.959	1.34	2.89	28.6	0.01	103.0
1689	--	34.817	0.18	2.75	24.6	0.01	52.4
1989	2.88	35.393	2.49	2.68	27.3	0.01	126.0

DEPTH	Chl. a µg/l.	INSITU C^{14} µgC/l./d.	C^{14}-1000 fc µgC/l./d.
1	0.03	2.7	8.5
9	0.02	1.8	6.4
17	0.02	2.3	4.1
29	0.02	0.2	5.1
58	0.10	0.3	4.5

REDUCED DATA

U. S. PROGRAM IN BIOLOGY — INTERNATIONAL INDIAN OCEAN PROGRAM

STATION NO. 110
CRUISE NO. 2
VESSEL R/V ANTON BRUUN
DATE 27-V-63
RELIABILITY OF DEPTH

LAT. 09° 46' N
LONG. 70° 06' E
DEPTH 4500 M
TIME 1309
WIND

PRIMARY PROD. .08 g C /m²/day
EXT. COEFF. (k) 0.07
RADIATION 285 g.cal./cm²/day
ZOOPLANKTON VOL.
IOSN STD. TOW 4.7 ml./m.²

DEPTH	TEMP.	SAL. ‰	O_2 ml./l.	PO_4-P µgA/l.	NO_3-N µgA/l.	NO_2-N µgA/l.	SiO_3 Si µgA/l.		
1	29.50	34.590	5.07	0.08	0.3	0.10	1.7		
25	29.50	34.580	4.94	0.10	0.1	0.01	2.4		
48	28.13	35.490	5.08	0.21	u	0.04	2.1		
73	26.22	36.010	3.87	0.61	5.6	0.08	3.2		
97	22.68	35.700	1.52	1.42	20.1	0.04	9.8		
121	19.38	35.407	0.70	1.95	25.9	0.02	9.2		
145	17.01	35.124	1.04	1.87	24.4	0.07	23.9		
194	15.11	35.310	0.36	2.26	27.1	0.01	25.9		
290	12.66	35.296	0.29	2.35	28.6	0.03	29.4		
387	11.58	35.277	0.34	---	28.4	0.12	35.3		
485	10.96	35.315	0.45	2.59	32.4	0.01	42.7		
583	10.34	35.329	0.46	2.65	31.8	0.01	51.8		
681	9.44	35.251	0.33	2.75	35.8	0.01	52.6		
780	8.63	35.184	0.52	2.79	33.1	u	68.1		
879	8.07	35.155	0.56	2.80	33.7	0.01	74.0		
979	7.29	35.089	0.80	2.84	34.5	0.01	82.8		
932	7.70	35.122	0.62	2.83	32.8	0.02	79.5		
1126	6.64	35.068	0.84	2.83	36.4	0.02	88.8		
1319	5.50	34.997	1.16	2.86	34.0	0.01	101.2		
1607	3.92	34.869	2.02	2.72	37.2	0.01	117.8		
1896	3.01	34.812	2.53	2.67	37.7	0.01	126.0		

DEPTH	Chl. a µg/l.	INSITU C^{14} µgC/l./d.	C^{14}-1000 fc µgC/l./d.	
1	0.06	2.5	2.7	
10	0.04	2.5	6.6	
20	0.05	1.5	2.8	
33	0.05	0.6	2.5	
66	0.10	0.1	1.9	

REDUCED DATA

U. S. PROGRAM IN BIOLOGY — INTERNATIONAL INDIAN OCEAN PROGRAM

STATION NO. 111
CRUISE NO. 2
VESSEL *R/V ANTON BRUUN*
DATE 28-V-63
RELIABILITY OF DEPTH

LAT. 08° 09' N
LONG. 70° 02' E
DEPTH 4590 M
TIME 1040
WIND

PRIMARY PROD. .13 g C /m²/day
EXT. COEFF. (k) 0.07
RADIATION 331 g.cal./cm²/day
ZOOPLANKTON VOL.
IOSN STD. TOW 4.7 ml./m.²

DEPTH	TEMP.	SAL. ‰	O_2 ml./l.	PO_4-P µgA/l.	NO_3-N µgA/l.	NO_2-N µgA/l.	SiO_3 Si µgA/l.
1	29.52	34.683	5.12	0.10	0.6	0.04	3.0
25	29.52	34.672	5.24	0.10	0.2	0.04	3.9
50	27.82	35.599	5.01	0.30	0.2	0.02	3.0
75	25.15	35.649	2.94	0.89	11.3	0.13	7.0
100	21.75	35.519	1.59	1.50	21.5	0.06	12.6
125	19.52	35.489	0.46	2.05	26.2	0.03	18.1
150	17.50	35.410	0.46	2.14	28.4	0.06	22.6
200	14.16	32.270	0.86	2.15	31.6	0.01	25.7
300	12.06	35.234	0.96	2.19	30.2	0.03	29.6
400	11.21	35.228	0.87	2.33	32.5	0.06	35.6
500	10.23	35.155	0.68	2.51	36.8	0.02	45.4
600	9.63	35.184	0.46	2.68	37.2	0.01	54.5
700	9.01	35.175	0.51	2.77	36.1	0.01	64.0
800	8.19	35.122	0.63	2.80	35.9	0.01	71.3
900	7.41	35.053	0.83	2.80	35.3	0.01	78.5
1000	6.83	35.009	0.96	2.83	38.5	0.01	86.5
995	6.95	35.029	0.93	2.80	38.5	0.01	85.1
1195	6.11	35.001	1.13	2.80	39.3	u	95.7
1395	5.16	34.959	1.50	2.80	37.7	0.01	104.9
1695	3.66	34.859	2.31	2.70	34.6	0.01	116.8
1995	2.83	34.809	2.75	2.61	33.5	0.02	126.0

DEPTH	Chl. a µg/l.	INSITU C^{14} µgC/l./d.	C^{14}-1000 fc µgC/l./d.
1	0.01	1.7	3.3
10	0.02	2.6	5.2
20	0.02	6.8	3.8
33	u	0.6	4.4
66	0.24	u	4.5