OCEANOGRAPHICAL OBSERVATIONS
IN THE INDIAN OCEAN IN 1963
H.M.A.S. *GASCOYNE*
Cruise G 1/63

OCEANOGRAPHICAL CRUISE REPORT NO. 21

DIVISION OF FISHERIES AND OCEANOGRAPHY
COMMONWEALTH SCIENTIFIC AND INDUSTRIAL
RESEARCH ORGANIZATION, AUSTRALIA 1965

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H.M.A.S. GASCOYNE

Cruise G1/63

(Seasonal Biological Cruise No. 3)

COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANIZATION,
AUSTRALIA
MELBOURNE, 1965

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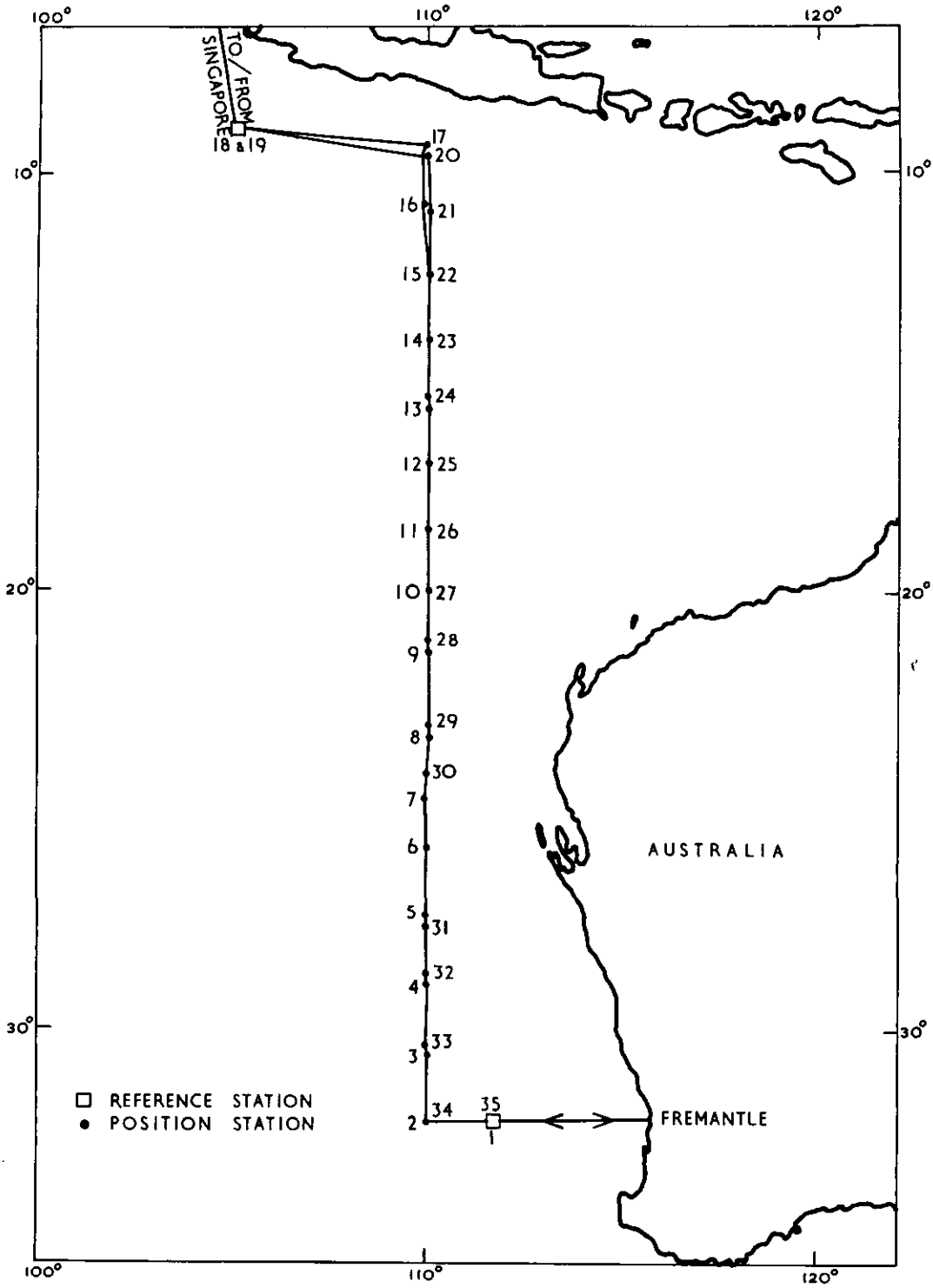
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OCEANOGRAPHICAL CRUISE REPORT

NO. 21

Oceanographical Observations in the Indian Ocean in 1963

H.M.A.S. Gascoyne

Cruise G1/63

January 17 - February 17, 1963

I. INTRODUCTION

This report records the data for the first cruise in 1963 of H.M.A.S. Gascoyne, Royal Australian Navy frigate, in the Indian Ocean; this cruise is the third of the seasonal biological cruises.

Objectives

These were - to determine zooplankton biomass, primary production, pigments, particulate carbon, and micronekton abundance along the 110°E. meridian and to examine the environmental factors likely to influence these biological properties, and the inter-relations of these properties with particular reference to the dynamics of production.

Itinerary

The cruise commenced at Fremantle on January 17, occupied SCOR-UNESCO Reference Station 1, and then a series of stations north along the 110°E. meridian to SCOR-UNESCO Reference Station 2, proceeded through Sunda Strait to Singapore and then back along the same route to Fremantle (Fig. 1).

Scientific Personnel

B. Newell (Cruise Leader)
F. Davies
C. Ho, University of Malaya (Feb. 4-17)
T. Khan, Pakistan Council for Scientific and Industrial Research, Karachi
A. Magnier, Institut Francais d'Oceanie, Noumea
T. Middleton
B. Scott

The analyses of hydrological samples were done in the ship's laboratory by Mr Davies. Nitrate analyses were done at Cronulla by Mr Klye. The primary production samples were taken and incubated aboard by Mr Scott who also made the counts at Cronulla. The samples for pigment determination were taken aboard by Mr Middleton, and the analyses were done at Cronulla by Mr Wootton. The zooplankton samples were weighed at Cronulla under the direction of Mr D.J. Tranter. Micronekton samples were weighed at Noumea.

The data were processed under the direction of Mr Hedge, by Mrs Bailey, Miss Hammond, Mrs Sander and Miss Wanstall. The track chart was prepared for publication by Mr Breach and Mrs Cozens.

II. WORK ACCOMPLISHED

Thirty-five stations were worked (G1/1/63-G1/35/63). Bathythermograph casts were made at 35 stations. Sub-surface hydrology samples were collected at 31 stations; surface hydrology, primary production, particulate carbon, pigments, and zooplankton samples were collected at 35 stations; micronekton samples were collected at 16 stations.

TABLE 1

WORK DONE AT EACH STATION

Stn No.	BT	Hydrology 1	Hydrology 2	Hydrology 3	Prim.Prod. 1	Prim.Prod. 2	Prim.Prod. 3	Part. Carbon	Pig-ments	Zooplankton 1	Zooplankton 2	Zooplankton 3	Micro-nekton
1	+	+	4500				+	+	+	+			+
2	+	+	5000			+	+	+	+	+	+		
3	+	+		+			+	+	+	+	+		+
4	+	+	5000			+	+	+	+	+	+		
5	+	+		+			+	+	+	+	+		+
6	+	+	1100				+	+	+		+		
7	+	+					+	+	+		+	+	+
8	+	+	1100				+	+	+	+	+		
9	+	+		+			+	+	+	+	+		+
10	+	+	3500			+	+	+	+	+	+		
11	+	+		+			+	+	+	+	+		+
12	+	+	5000				+	+	+	+	+		
13	+	+		+			+	+	+	+	+		
14	+	+	5000			+	+	+	+	+	+		

Stn	BT	Hydrology 1	Hydrology 2	Hydrology 3	Prim.Prod. 1	Prim.Prod. 2	Prim.Prod. 3	Part. Carbon	Pig-ments	Zooplankton 1	Zooplankton 2	Zooplankton 3	Micro-nekton
15	+	+		+			+	+	+	+	+		+
16	+	+	5000			+	+	+	+	+	+		
17	+	+		+			+	+	+		+		+
18	+	+	6000		+		+	+	+	+	+		+
19	+	+	6000				+	+	+	+			
20	+	+	1100				+	+	+	+	+		
21	+	+		+			+	+	+	+	+		+
22	+	+	4500				+	+	+	+	+		
23	+	+		+			+	+	+	+	+		+
24	+	+	5000				+	+	+	+	+		
25	+	+		+			+	+	+	+	+		+
26	+	+	5000				+	+	+	+	+		
27	+	+		+			+	+	+	+	+		+
28	+	+	4500				+	+	+	+	+		
29	+	+					+	+	+	+	+		+
30	+	+	4500				+	+	+	+	+		
31	+	+	5000				+	+	+	+	+		
32	+	+					+	+	+	+	+		+
33	+	+	5000				+	+	+	+	+		
34	+	+					+	+	+	+	+		+
35	+	+	4500				+	+	+	+	+		

BT — Bathythermograms

Hydrology
1 Surface
2 Sub-surface to depth (m)
3 To 500 m only for temperature and salinity

Prim.Prod. — Primary Production
1 In situ incubation
2 Simulated in situ incubation
3 Artificial constant light incubation

Part.Carbon — Particulate Carbon

Zooplankton
1 Indian Ocean Standard net
2 Clarke-Bumpus horizontal hauls
3 Clarke-Bumpus oblique hauls

Micronekton — Mid-water trawl

III. METHOD OF COLLECTION AND ANALYSIS OF SAMPLES

1. Physics

Temperature.- Water temperatures were taken with deep-sea reversing thermometers; protected thermometers with a range of -2° to 30°, and unprotected thermometers with a range of -2° to 30° or -4° to 60°. The accuracy of the temperatures is considered to be ± 0.03°. The readings are recorded in degrees Celsius.

Bathythermograms.- A 900 ft bathythermograph was used at the stations indicated in Table 1. A photograph of each slide is filed at Cronulla.

Thermometric Depth.- Depth calculations were made by the method described by Pollak (1950), and are considered accurate to ± 15 m at depths greater than 1000 m and to 1% above that depth.

Sigma-t.- Sigma-t values were calculated by computer, using the Table of σ_t given by La Fond (1951).

2. Chemistry

Salinity.- Salinity was measured on board with an inductive salinometer (Brown and Hamon 1961).

Dissolved Oxygen.- The standard Winkler method (Jacobsen, Robinson and Thompson 1950) was used with potassium iodate as the iodometric standard. Samples were collected in 275-300 ml capacity bottles and 100 ml duplicate aliquots were titrated to a starch end point. Values are given as ml/l. Duplicate titrations agreed to better than 0.03 ml/l of oxygen.

Oxygen Saturation.- Oxygen percentage saturation values were calculated by computer using the equation of Richards and Corwin (1956).

Inorganic Phosphate.- The method of Atkins (1923) was used with 1 ml molybdate reagent (300 ml 10% ammonium molybdate and 100 ml 50% sulphuric acid) and 0.1 ml 1% stannous chloride diluted afresh from a 40% stock solution in

hydrochloric acid, which was kept under paraffin. The reagents were automatically dispensed by a piston dispenser.

Standard phosphate solutions were made up in distilled water. At air temperatures less than 25° analyses were carried out in batches of 10; readings were begun within 10 minutes of adding reagents, and completed within 10 minutes. At air temperatures greater than 25° batches of 6 were analysed; readings were begun within 5 minutes of adding reagents and completed within 7 minutes. Each batch was compared with a distilled water blank and a 0.65 µg at./l standard in a Hilger Spekker absorptiometer using 4 cm cells and Ilford 608 filters. Each day a complete calibration was made using standards up to 3.25 µg at./l. Results are given as µg at./l without any correction for salt error and are precise to ± 10% for values less than 0.5 µg at./l and ± 5% for higher values. If it is wished to correct for salt effects the results given should be multiplied by 1.15.

Total Phosphorus.- 100 ml samples were drawn from the Nansen bottles into 150 ml Pyrex conical flasks, 0.2 ml of 72% perchloric acid was added and digestion at 200°-250° carried out immediately on a sand tray. After evaporation of water, heating was continued until fuming of the salt residue commenced. The samples were then allowed to cool and 100 ml of distilled water and 2 drops of 2% phenolphthalein were added. If alkaline, perchloric acid was added until a slight acidity persisted. The flasks were allowed to stand for about 24 hours to allow the salts to dissolve. Phosphate was then determined as described above for inorganic phosphate. Results are given as µg at./l, without salt correction. If it is wished to correct for salt effects, the results given should be multiplied by 1.15.

Nitrate.- After collection, water samples were stored in plastic bottles and preserved with 2 drops of saturated $HgCl_2$. Nitrate was determined at Cronulla by the strychnidine method (Rochford 1947). The reagent was prepared by the addition of 0.64 g strychnidine to a litre of nitrate-free sulphuric acid. 5 ml of this reagent were added, with minimum agitation, to 5 ml seawater or standard nitrate solution. The standards were made up in a mixture of equal volumes of artificial seawater and nitrate-free

sulphuric acid. The standards and samples were shaken to distribute the reagent, and the colour developed for 2 hours. The solutions were read in a UNICAM SP 600 spectrophotometer at a wavelength of 530 mμ using a 5 mm cell. Samples with an absorbance greater than that of the standard corresponding to 14.4 μg at./l were diluted with artificial seawater-sulphuric acid mixture before reading. Results are given in μg at./l.

Particulate Carbon.- Six litres of seawater, collected by means of a twin sampler (Jitts 1964) were passed through a Whatman GF/C glass paper filter 25 mm in diameter. The filters were returned to Cronulla for particulate carbon estimation by the method of Dal Pont and Newell (1963).

3. Primary Production

Water samples were aliquots of those taken in the twin 6 l. plastic sampler for pigment measurements. The samples were poured into 300 ml Pyrex bottles and incubated (1) *in situ*, (2) in a simulated *in situ* incubator, or (3) in artificial constant light of 1100 ft candles. Geiger counting was done on board with a windowless counter. The details of the methods are given in Dyson *et al.* (1965).

4. Pigments

Water samples were taken with a plastic sampler and filtered within one or two hours through HA Millipore filters. The filters were placed in glass tubes and stored in metal desiccators over silica gel. The analyses were carried out at Cronulla using the method given by Humphrey (1960), except that 4 cm cells were used in UNICAM SP 600 spectrophotometer and 9 ml 90% acetone were used for extraction.

5. Zooplankton

Sampling consisted of

(a) Vertical hauls through the upper 200 m with the Indian Ocean Standard Net (IOSN)

(b) Horizontal tows within the 200 m-0 stratum with Clarke-Bumpus Samplers (CBS)

(a) Vertical Hauls 200-0 m: The IOSN was used in the standard manner (Currie 1963) except that a heavier (100 lb) weight was attached to keep the net under control; this was replaced with a 30 lb weight during washing operations. No flowmeter was used. Wire angle averaged 20° and never exceeded 40°. The length of wire paid out to place the net at 200 m varied from 200-260 m with a mean of 214 m.

Samples were removed from the net in the following manner. The plankton bucket was detached and the contents poured into a larger container and the bucket replaced. The net was lowered into the water up to the ring and raised again, and the washings collected as before. Remnants still adhering to the codend were washed into the bucket by slopping water from the outside and these, too, collected. Finally the net was lowered into the water and washed through without the bucket attached.

Sampling was in duplicate, the one haul immediately following the other. One sample is lodged with the Indian Ocean Biological Centre, Cochin, India; the other is at Cronulla.

(b) Horizontal Tows: Four CBS were towed simultaneously at approximately 200, 100, 50 and 0 m. The duration of the tow was approximately 45 minutes. The wire angle was kept within the limits 45°-60°, the ship's speed being 2-3 kt. Depth recorders (Hamon, Tranter and Heron 1963) were attached. These record both the depth range and the modal depth. CBS were washed by hand in the laboratory and the entire catch removed.

Storage of Samples

Samples were concentrated in the shipboard laboratory and stored in plastic bottles. Neutralized formalin was added to a final concentration of 10%.

Biomass Determination

Biomass was determined at Cronulla approximately one month after the end of the cruise. Each sample was strained off in a weighing dish and allowed to drain (weighing dishes with a base of 7 cm^2 and 80 meshes per inch gauze were used

for CB samples, and ones with a base of 25 cm^2 and 60 meshes per inch gauze were used for IOSN samples). The drained sample was then washed several times in 50% alcohol to remove extraneous water and allowed to drain on an absorbent cloth which was repeatedly wrung dry. When the samples began to show signs of friability the weighing dish was carefully dried and the sample weighed. The entire operation took 5-10 minutes depending on the size of the sample. Samples containing large quantities of gelatinous material took longer. The routine procedure was to weigh the entire catch, and where exceptionally large organisms occurred (weighing more than half the rest of the catch), to make a second weighing without these.

Estimation of Volume Filtered

In estimating volume filtered by the IOSN it was assumed that 1 metre of wire out results in 1 m^3 of water filtered (the mouth area of the net being 1 m^2). Estimates of volume filtered by CBS are based on flowmeter readings referred to calibrations made before and after the cruise (Tranter 1962).

6. Micronekton

The micronekton programme, more correctly termed the midwater trawl programme, consisted of oblique tows through the upper 200 m layer with a 5 ft Isaacs-Kidd midwater trawl. The tows were made at every night station. The programme was conducted, in the field and in the laboratory, by the staff of the Laboratoire d'Oceanographie of the Institut Francais d'Oceanie.

On the Ship

(a) The gear: This consisted of a 5 ft Isaacs-Kidd midwater trawl, scaled down from the 6 ft trawl (King and Iversen 1962; Aron 1960). No flowmeter was used.

(b) Handling: The trawl was fitted with a depth recorder (Hamon, Tranter and Heron 1963) and lowered from the stern while the ship's speed was 2 kt. When the trawl was clear of the ship, speed was increased to 5 kt and the wire was paid out at 40-50 m per minute under a constant and minimum

tension. After 600 m of wire had been paid out, the ship's speed was reduced to 3 kt and further adjusted according to the reading of a tension gauge. A final 100 m was then paid out making the total 700 m. After 5 minutes the wire was retrieved at a winch speed of 9 m/min. The average time at which the tows were made was 10 p.m. The paying-out period averaged 15 minutes and the retrieval period 80 minutes.

(c) Collecting and storing the samples: The net was washed from outside into the bucket which was then removed from the net. The net was checked for organisms caught in the meshes (e.g. Leptocephali); these were removed. The samples were stored in 10% neutralized formalin in plastic jars; larger organisms were stored separately.

In the Laboratory

Samples were sorted by taxa 1-2 months after collection. The wet volumes were measured by displacement and counts of sub-samples were made. The taxa could be pooled into 4 main categories:

1. Gelatinous organisms (Medusae, Salps, Siphonophores) - no counts were made, the components being very often broken.

2. Planktonic organisms of relatively small size - no counts were made, the components being too numerous.

3. Macroplanktonic organisms - counts were made for each of the following components and in some cases for genus: Annelids, Pteropods, Heteropods, Chaetognaths, Amphipods, Stomatopods, Carids, Penaeids, Mysids, Euphausiids, Phyllosomas.

4. Micronektonic organisms - counts were made for each of the following components: Fishes, Fish larvae, Leptocephali, Cephalopods. Counts were made by species and by size for the fishes.

The categories 3 and 4 which predominate in midwater trawl samples are not clearly distinguished. Detailed results

will be published separately; average conversion factors, determined for each taxa or category, were used to convert from wet volume to dry weight (the dry weight was obtained by keeping the sample at 60°, in an oven, until the weight remained constant, usually 24 hours). A table of these conversion factors is given along with the data.

The categories 1 and 2 are comparable to the organisms obtained by the usual conical plankton net. Results are expressed in dry weight per average tow (using the general average conditions for all stations - 15 minutes for paying out, 5 minutes for horizontal tow, 78 minutes for retrieval). Results are then directly comparable.

From the above data it is possible to convert to absolute terms by a method already used by King and Iversen (1962) and Aron (1960). Assuming that (a) the speed of the trawl was known, (b) the trawl was working during paying out and retrieval in a manner proportional to the ship's speed, (c) all the water passing through a definite section of the net was filtered and (d) all the organisms passing through this section were caught, then the front end surface can be used to calculate the minimum value filtered. This gives the following results:

Assumed maximum volume of water filtered per average tow

$= 1.929\ m^2 \times 10{,}00\ m = 19{,}290\ m^3$

Assumed minimum volume of water filtered per average tow

$= 0.197\ m^2 \times 10{,}000\ m. = 1{,}970\ m^3$

From these estimates of maximum and minimum volume filtered it would be possible to convert the data (p.129) to mg/m^3 (minimal and maximal estimates).

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IV. DATA SHEETS AND TABLES

The data were listed on an I.B.M. 1401. An explanation of the headings for each set of data sheets is given at the beginning of the relevant part.

DATA

PART 1

HYDROLOGY

DEEP STATIONS

EXPLANATION OF HEADINGS

Part 1 — **Hydrology - Deep Stations**

STATION — Gives the station identification, for example, G1/2/63 signifies the 2nd station worked by Gascoyne in 1963, on her 1st cruise for that year

DATE — Given as day/month/year

TIME — Given in Zone Time, and is the time at the beginning of the first cast. The code letter used for the time zone (Table 2) follows the time

TABLE 2

CODE FOR TIME ZONES

Longitude Exceeding	Up to but not exceeding	Time Zone (hrs)	Code
07°30'E.	22°30'E.	-1	A
22°30'E.	37°30'E.	-2	B
37°30'E.	52°30'E.	-3	C
52°30'E.	67°30'E.	-4	D
67°30'E.	82°30'E.	-5	E
82°30'E.	97°30'E.	-6	F
97°30'E.	112°30'E.	-7	G
112°30'E.	127°30'E.	-8	H
127°30'E.	142°30'E.	-9	I
142°30'E.	157°30'E.	-10	K
157°30'E.	172°30'E.	-11	L
172°30'E.	180°	-12	M
180°	172°30'W.	+12	Y
172°30'W.	157°30'W.	+11	X
157°30'W.	142°30'W.	+10	W
142°30'W.	127°30'W.	+9	V
127°30'W.	112°30'W.	+8	U
112°30'W.	97°30'W.	+7	T
97°30'W.	82°30'W.	+6	S
82°30'W.	67°30'W.	+5	R

Longitude Exceeding	Up to but not exceeding	Time Zone (hrs)	Code
67°30'W.	52°30'W.	+4	Q
52°30'W.	37°30'W.	+3	P
37°30'W.	22°30'W.	+2	O
22°30'W.	07°30'W.	+1	N
07°30'W.	07°30'E.	0	Z

LATITUDE LONGITUDE	Given in degrees and minutes
SONIC DEPTH	Given in metres, measured at standard sound velocity of 800 fm (1463 m) per second
AIR TEMP. WET DRY	Air temperatures recorded from wet and dry bulb thermometers in °C
WIND DIR. SP.	Wind direction and speed are coded using Tables 8 and 9 in U.S. Hydrogr. Office (1955)
ANEM. HEIGHT	The average height of the anemometer above sea level, given in metres
CLOUD TYPE AMT.	Cloud type and amount are coded using Tables 2 and 3 in U.S. Hydrogr. Office (1955)
VIS.	Visibility is coded using Table 4 in U.S. Hydrogr. Office (1955)
SEA DIR. AMT.	Sea direction and amount are coded using Tables 5 and 8 in U.S. Hydrogr. Office (1955)
SWELL DIR. AMT.	Sea swell direction and amount are coded using Tables 6 and 8 in U.S. Hydrogr. Office (1955)
ATMOS. PRESSURE	Atmospheric pressure given in millibars

WIRE ANGLES CAST 1 CAST 2	Wire angles are measured at the surface and expressed in degrees for each cast. An asterisk indicates that the wire angle was not measured
CAST	The cast number corresponding to the wire angle is shown
DEPTH	Actual sampling depth, given in metres
TEMP.	Sea temperatures recorded in °C
SALINITY	Given in parts per thousand
SIGMA-T	Sigma-t to 2 decimal places
OXYGEN	Given in ml/l
OXYGEN % SAT.	Oxygen percentage saturation
INORG. P, TOTAL P and NITRATE	Given in µg at./l
***	Indicates no data available

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 1/63	18/ 1/63	0830 H	32 00 S	111 52 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	WIRE ANGLES CAST2
5081	18.2	19.6	16	05	15	6	6	6	16	3	16	4	1014.2	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
2	0	20.24	35.899	25.39	5.14	103	0.11	0.23	00.0
2	24	20.14	35.898	25.42	5.15	103	0.11	***	00.0
2	48	20.02	35.897	25.45	5.12	103	0.12	0.23	00.0
2	72	18.90	35.867	25.72	5.28	103	0.14	***	00.0
2	95	17.10	35.790	26.11	***	***	0.13	0.31	00.0
2	143	15.02	35.603	26.44	5.51	100	0.14	***	00.1
2	190	13.88	35.450	26.57	5.28	93	0.44	0.46	01.7
2	286	12.41	35.239	26.72	5.54	95	0.49	0.63	03.2
2	477	9.53	34.747	26.85	5.62	90	0.91	0.93	11.4
2	669	8.40	34.605	26.92	5.33	83	1.13	1.17	10.4
2	860	5.65	34.418	27.15	4.48	65	1.60	1.66	26.6
2	1052	3.94	34.437	27.36	3.89	54	1.86	1.90	32.8
1	1229	3.37	34.505	27.47	3.66	50	1.96	2.03	30.0
1	1422	3.00	34.576	27.56	3.59	48	1.97	1.97	36.3
1	1908	2.43	34.706	27.72	3.66	49	1.96	2.01	33.3
1	2396	1.97	34.732	27.78	3.80	50	1.93	2.01	***
1	2884	1.70	34.736	27.80	4.06	53	1.92	1.92	31.2
1	3373	1.51	34.732	27.81	4.18	54	1.92	1.90	32.4
1	3863	***	34.722	***	4.33	***	1.89	1.92	35.1
1	4353	1.18	34.719	27.82	4.46	57	1.89	1.88	34.2

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 2/63	19/ 1/63	0800 H	32 00 S	110 00 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	WIRE ANGLES CAST2
5081	18.2	19.7	13	03	15	6	7	6	*	2	15	1	1011.4	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
2	0	20.93	35.787	25.12	4.99	102	0.10	0.23	00.0
2	25	20.78	35.784	25.16	5.06	103	0.10	***	00.0
2	49	17.92	35.789	25.91	5.45	105	0.12	0.28	00.0
2	74	16.11	35.725	26.29	5.77	107	0.14	***	00.0
2	98	14.91	35.594	26.46	5.57	101	0.17	0.37	00.0
2	147	13.61	35.434	26.62	5.50	97	0.34	***	04.0
2	195	12.49	35.242	26.65	5.34	92	0.52	0.58	08.4
2	293	11.42	35.070	26.78	5.61	94	0.61	0.70	14.8
2	488	9.32	34.726	26.87	5.52	88	0.95	1.11	12.4
2	683	8.08	34.574	26.94	5.16	79	1.18	1.31	15.2
2	878	5.43	34.402	27.17	4.50	65	1.63	1.82	28.2
2	1072	3.86	34.433	27.37	3.93	54	1.84	1.92	33.3
1	1262	3.33	34.514	27.48	3.61	49	2.03	2.01	40.2
1	1458	3.07	34.600	27.58	***	***	1.96	2.01	43.5
1	1947	2.46	34.699	27.71	3.68	49	1.96	1.99	37.8
1	2437	2.05	34.728	27.77	3.81	51	1.94	2.01	31.2
1	2929	1.72	34.738	27.80	4.00	52	1.89	2.01	35.4
1	3421	1.46	34.728	27.81	4.21	54	1.88	2.06	31.8
1	3918	1.26	34.722	27.82	4.35	56	1.88	1.98	35.1
1	4415	1.09	34.715	27.83	4.52	58	1.85	1.94	30.9
1	4912	1.02	34.712	27.83	4.69	60	1.85	1.94	27.0

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 3/63	19/ 1/63	2000 H	30 31 S	110 01 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	WIRE ANGLES CAST2
5321	18.4	20.4	21	04	15	6	4	6	*	2	20	1	1011.9	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	21.94	35.807	24.86	***	***	***	***	***
1	22	21.53	35.802	24.97	***	***	***	***	***
1	43	20.55	35.877	25.29	***	***	***	***	***
1	65	19.63	35.859	25.52	***	***	***	***	***
1	85	17.98	35.827	25.92	***	***	***	***	***
1	128	16.06	35.724	26.30	***	***	***	***	***
1	171	14.88	35.570	26.45	***	***	***	***	***
1	257	12.04	35.133	26.71	***	***	***	***	***
1	425	9.80	34.725	26.79	***	***	***	***	***

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 4/63	20/ 1/63	0800 H	29 00 S	110 00 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	WIRE ANGLES CAST2
5563	18.9	21.7	21	05	15	4	4	6	*	2	19	1	1013.5	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
2	0	22.13	35.692	24.72	5.01	104	0.09	0.25	00.2
2	24	21.76	35.697	24.83	5.03	104	0.09	***	00.1
2	48	21.38	35.702	24.93	5.03	103	0.08	0.30	00.2
2	72	19.72	35.774	25.44	5.10	101	0.13	***	00.1
2	95	19.04	35.768	25.61	5.07	100	0.14	0.25	00.0
2	143	18.05	35.837	25.91	4.87	94	0.19	***	00.8
2	188	16.90	35.818	26.18	5.08	96	0.23	0.36	00.7
2	278	14.54	35.562	26.53	5.27	100	0.33	0.47	02.0
2	454	10.65	34.945	26.81	5.56	91	0.76	0.92	08.4
2	633	9.02	34.698	26.89	5.50	87	1.00	1.09	11.2
2	815	6.57	34.469	27.08	4.73	70	1.42	1.59	25.4
2	992	4.53	34.460	27.32	3.69	52	1.88	1.97	29.0
1	1285	3.65	34.565	27.49	3.18	44	2.03	2.01	27.9
1	1481	3.15	34.615	27.58	3.32	45	1.92	2.03	27.9
1	1974	2.45	34.712	27.72	3.56	47	1.94	1.92	27.9
1	2467	2.00	34.735	27.78	3.71	49	1.94	2.10	27.6
1	2958	1.67	34.735	27.80	3.96	51	1.82	2.01	27.6
1	3450	1.45	34.730	27.81	4.19	54	1.84	2.01	26.7
1	3942	1.28	34.724	27.82	4.37	56	1.87	2.03	27.0
1	4436	1.15	34.719	27.83	4.42	57	1.84	1.97	27.0
1	4928	1.10	34.718	27.83	4.67	60	1.84	1.97	27.3

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 5/63	20/ 1/63	2030 H	27 30 S	110 00 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	WIRE ANGLES CAST2
5658	18.9	21.7	15	04	15	6	7	6	*	3	18	4	1014.8	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	23.50	35.473	24.16	***	***	***	***	***
1	25	23.47	35.468	24.16	***	***	***	***	***
1	50	20.18	35.716	25.27	***	***	***	***	***
1	75	19.21	35.751	25.55	***	***	***	***	***
1	100	18.57	35.791	25.75	***	***	***	***	***
1	150	17.75	35.817	25.97	***	***	***	***	***
1	200	16.18	35.739	26.29	***	***	***	***	***
1	300	13.37	35.397	26.64	***	***	***	***	***
1	500	9.72	34.790	26.85	***	***	***	***	***

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 6/63	21/ 1/63	0830 H	26 00 S	110 00 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	WIRE ANGLES CAST2
4259	19.6	22.8	15	06	15	6	6	6	*	4	17	4	1014.2	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	23.04	35.562	24.36	4.84	102	0.15	0.26	00.3
1	23	22.60	35.622	24.53	4.97	104	0.14	***	00.2
1	46	21.70	35.695	24.84	4.97	102	0.14	0.23	00.2
1	69	20.26	35.764	25.29	5.19	104	0.14	***	00.1
1	91	19.42	35.779	25.52	5.20	103	0.14	0.24	00.0
1	137	18.00	35.813	25.91	4.95	95	0.19	***	00.3
1	184	17.18	35.807	26.10	5.03	95	0.26	0.30	00.5
1	275	14.43	35.522	26.51	5.28	94	0.34	0.47	02.0
1	459	9.76	34.791	26.85	5.57	89	0.92	0.95	13.2
1	645	8.01	34.565	26.95	5.16	79	1.24	1.39	20.4
1	830	5.28	34.464	27.24	3.80	54	1.75	1.91	26.4
1	1020	4.66	34.602	27.42	2.53	35	2.18	2.25	27.0

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 8/63	22/ 1/63	0830 H	23 17 S	110 04 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	WIRE ANGLES CAST2
3795	23.7	26.2	15	04	15	4	2	6	*	3	17	7	1007.9	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	24.88	35.252	23.58	4.61	100	0.14	0.25	00.1
1	25	24.84	35.256	23.60	4.68	102	0.13	***	00.1
1	50	22.11	35.436	24.53	4.95	103	0.15	0.25	00.3
1	75	21.12	35.086	24.54	4.76	97	0.17	***	00.3
1	100	20.32	35.523	25.09	4.31	86	0.27	0.42	01.3
1	150	19.11	35.678	25.52	4.25	83	0.33	***	02.2
1	200	17.75	35.727	25.90	4.33	85	0.40	0.46	01.2
1	299	14.59	35.529	26.48	4.92	89	0.45	0.62	02.8
1	496	10.12	34.860	26.84	5.36	87	0.45	0.62	11.8
1	692	7.32	34.528	27.03	4.79	73	1.40	1.48	23.0
1	886	4.94	34.522	27.32	3.16	45	2.03	2.01	26.4
1	1080	4.34	34.576	27.43	2.71	38	***	2.14	27.3

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 10/63	23/ 1/63	0830 H	20 00 S	110 00 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	WIRE ANGLES CAST2
4314	23.3	27.2	15	02	15	6	3	6	*	2	17	4	1006.5	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
2	0	27.51	34.840	22.44	4.51	102	0.13	0.22	00.3
2	25	27.42	34.835	22.47	4.53	102	0.13	***	00.1
2	50	26.25	34.804	22.82	4.61	102	0.13	0.23	00.3
2	75	***	34.902	***	4.24	***	0.25	***	00.4
2	100	22.10	34.934	24.15	3.49	72	0.51	0.52	04.6
2	150	19.88	35.015	24.82	3.02	60	0.77	***	08.6
2	200	18.05	35.264	25.47	3.37	65	0.76	0.93	06.8
2	298	15.36	35.524	26.31	4.50	82	0.51	0.57	04.4
2	495	8.99	34.709	26.91	5.21	82	1.12	1.09	16.2
2	691	6.46	34.600	27.19	2.65	39	1.96	1.90	25.8
2	886	5.47	34.626	27.34	2.09	30	2.22	2.16	26.4
3	1097	4.73	34.633	27.43	2.20	31	2.22	2.18	27.0
1	1276	4.16	34.645	27.50	2.37	33	2.22	2.14	26.7
1	1474	3.50	34.665	27.59	2.71	37	2.16	2.14	25.5
1	1969	2.42	34.721	27.73	3.21	43	2.04	2.08	24.9
1	2465	1.96	34.732	27.78	3.55	47	2.10	2.03	26.4
1	2960	1.64	34.728	27.80	3.78	50	2.04	1.95	26.1
1	3455	1.32	34.725	27.82	4.17	54	1.99	1.92	25.2

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 9/63	22/ 1/63	2030 H	21 30 S	110 00 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	WIRE ANGLES CAST2
4986	24.2	25.8	16	03	15	4	1	6	*	3	18	4	1006.0	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	25.67	34.969	23.12	***	***	***	***	***
1	25	28.25	35.072	22.37	***	***	***	***	***
1	50	22.51	35.110	24.17	***	***	***	***	***
1	75	21.02	35.244	24.68	***	***	***	***	***
1	100	20.98	35.273	24.72	***	***	***	***	***
1	150	19.51	35.506	25.29	***	***	***	***	***
1	200	18.36	35.748	25.77	***	***	***	***	***
1	300	14.27	35.473	26.51	***	***	***	***	***
1	500	9.40	34.763	26.89	***	***	***	***	***

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 11/63	23/ 1/63	2030 H	18 30 S	110 00 E

SONIC DEPTH	AIR TEMP. WET	DRY	WIND DIR.	SP.	ANEM. HEIGHT	CLOUD TYPE	AMT.	VIS.	SEA DIR.	AMT.	SWELL DIR.	AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	CAST2
4984	24.4	27.9	30	04	15	2	3	6	*	2	22	4	1006.3	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	27.88	34.829	22.32	***	***	***	***	***
1	25	27.47	34.794	22.42	***	***	***	***	***
1	50	25.69	34.728	22.94	***	***	***	***	***
1	75	***	34.735	***	***	***	***	***	***
1	100	23.02	34.971	23.92	***	***	***	***	***
1	150	19.99	35.055	24.82	***	***	***	***	***
1	200	17.75	35.273	25.55	***	***	***	***	***
1	300	14.06	35.312	26.43	***	***	***	***	***
1	500	8.81	34.689	26.92	***	***	***	***	***

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 12/63	24/ 1/63	0830 H	17 00 S	110 00 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	WIRE ANGLES CAST2
5563	25.0	28.6	32	03	15	8	1	6	*	2	21	1	1006.0	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
2	0	27.61	34.443	22.11	4.37	99	0.14	0.36	00.2
2	25	26.04	34.420	22.60	4.56	101	0.14	***	00.1
2	49	24.83	34.944	23.36	4.68	101	0.14	0.34	04.3
2	74	23.41	35.032	23.85	4.57	97	0.16	***	00.4
2	98	21.84	35.085	24.34	3.80	78	0.41	0.55	03.0
2	123	19.39	35.060	24.98	2.92	57	0.77	***	09.2
2	147	18.38	35.148	25.30	2.97	57	0.73	***	07.4
2	197	16.91	35.372	25.83	3.58	67	0.69	0.79	05.8
2	247	14.21	35.237	26.34	3.62	64	0.86	***	09.6
2	296	12.29	35.044	26.58	3.69	63	0.99	1.24	13.2
2	395	9.75	34.813	26.86	4.96	80	0.98	***	12.6
2	494	8.29	34.653	26.97	4.32	67	1.36	1.45	18.6
2	692	6.31	***	***	2.20	***	2.06	2.15	25.5
2	889	5.35	34.640	27.37	1.99	28	2.11	2.27	25.5
2	1086	4.70	34.649	27.45	2.09	29	2.19	2.38	25.8
1	1281	4.13	34.659	27.52	2.33	32	2.11	2.25	26.4
1	1478	3.51	34.679	27.60	2.69	37	2.19	2.22	26.4
1	1971	2.39	34.729	27.74	3.17	42	2.04	2.08	25.8
1	2464	1.95	34.735	27.78	3.47	45	2.05	2.12	22.2
1	2957	1.60	34.732	27.81	3.76	49	1.95	1.99	25.2
1	3451	1.33	34.724	27.82	4.08	52	1.93	2.10	25.2
1	3944	1.20	34.721	27.83	4.19	54	1.91	2.09	24.0
1	4437	1.15	34.717	27.83	4.27	55	1.97	2.05	24.6
1	4928	1.18	34.717	27.82	4.45	57	1.92	2.06	24.3

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 13/63	24/ 1/63	2030 H	15 44 S	110 00 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	WIRE ANGLES CAST2
5722	25.6	28.3	32	04	15	2	5	6	*	3	33	4	1004.7	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	27.89	34.671	22.19	***	***	***	***	***
1	25	26.49	34.833	22.76	***	***	***	***	***
1	50	25.30	34.909	23.19	***	***	***	***	***
1	75	23.11	35.104	23.99	***	***	***	***	***
1	100	22.02	35.182	24.36	***	***	***	***	***
1	150	19.30	35.092	25.03	***	***	***	***	***
1	200	***	35.090	***	***	***	***	***	***
1	300	12.50	35.114	26.59	***	***	***	***	***
1	500	8.20	34.636	26.98	***	***	***	***	***

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 14/63	25/ 1/63	0830 H	14 01 S	110 03 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	WIRE ANGLES CAST2
5676	25.8	27.8	26	04	15	1	6	6	*	3	26	4	1005.7	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
2	0	28.17	34.494	21.97	4.39	100	0.10	0.25	00.1
2	24	28.18	34.485	21.96	4.44	101	0.10	***	00.3
2	48	27.72	34.447	22.08	4.43	100	0.08	0.23	00.4
2	72	28.09	34.522	22.02	4.55	104	0.13	***	00.3
2	95	25.21	34.566	22.96	4.31	94	0.22	0.36	00.2
2	119	23.18	34.537	23.54	3.21	67	0.63	***	05.8
2	143	20.79	34.605	24.26	2.71	54	0.84	***	10.4
2	191	16.62	34.684	25.37	2.42	45	1.09	1.24	16.6
2	238	14.32	34.732	25.93	2.46	43	1.25	***	18.0
2	286	13.33	35.052	26.38	2.71	47	0.99	1.17	07.2
2	381	11.46	35.005	26.71	4.27	71	0.98	***	12.4
2	477	9.05	34.734	26.92	4.63	73	1.17	1.24	15.2
2	668	6.73	34.639	27.19	2.22	33	2.04	2.20	25.5
2	860	5.51	34.639	27.35	1.93	28	2.19	2.23	25.8
2	1052	4.68	34.639	27.44	2.00	28	2.21	2.27	25.5
1	1263	4.00	34.657	27.53	2.29	32	2.13	2.16	26.4
1	1458	3.45	34.677	27.60	2.54	34	2.19	2.30	24.9
1	1945	2.43	34.734	27.74	3.09	41	2.13	2.11	26.1
1	2433	1.94	34.737	27.78	3.47	45	2.03	2.11	24.9
1	2925	1.60	34.730	27.80	3.75	49	1.98	2.06	27.0
1	3418	1.39	34.724	27.81	3.99	51	1.98	2.06	21.6
1	3912	1.24	34.720	27.82	4.18	54	1.92	2.01	27.0
1	4406	1.14	34.720	27.83	4.25	54	1.92	1.93	26.7
1	4902	1.17	34.719	27.83	4.41	57	1.92	2.09	24.9

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 15/63	25/ 1/63	2030 H	12 30 S	110 00 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	WIRE ANGLES CAST2
3188	25.6	27.8	31	05	15	1	3	6	*	3	29	4	1007.0	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	27.72	34.452	22.08	***	***	***	***	***
1	23	27.72	34.442	22.08	***	***	***	***	***
1	45	26.89	34.532	22.41	***	***	***	***	***
1	68	25.66	34.530	22.80	***	***	***	***	***
1	90	25.12	34.534	22.97	***	***	***	***	***
1	135	23.50	34.905	23.73	***	***	***	***	***
1	170	19.69	34.870	24.76	***	***	***	***	***
1	250	13.85	34.664	25.97	***	***	***	***	***
1	383	9.57	34.715	26.82	***	***	***	***	***

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 16/63	26/ 1/63	0830 H	10 50 S	109 58 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	WIRE ANGLES CAST2
5585	25.0	27.3	28	04	15	1	4	6	*	3	28	4	1007.4	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	27.40	34.364	22.12	4.38	99	0.11	0.23	00.0
1	23	27.52	34.353	22.07	4.49	101	0.14	***	00.0
1	45	27.15	34.344	22.19	4.35	98	0.14	0.25	00.0
1	68	25.66	34.496	22.77	4.18	92	0.14	***	00.0
1	90	23.59	34.518	23.41	3.39	72	0.55	0.64	03.9
1	113	20.19	34.571	24.40	2.76	55	0.92	***	10.7
1	135	17.70	34.593	25.05	2.58	49	1.08	***	12.2
1	175	15.18	34.542	25.59	2.59	46	1.19	1.28	16.2
1	218	12.89	34.577	26.10	2.34	40	1.51	***	20.1
1	260	11.35	34.592	26.41	2.18	36	1.60	1.68	23.4
1	340	9.74	34.651	26.74	2.39	38	1.73	***	23.4
1	423	8.68	34.659	26.92	2.23	35	1.79	1.83	25.2
1	600	7.01	34.625	27.14	2.05	30	2.09	2.12	30.3
1	730	6.12	34.665	27.29	1.89	27	2.21	2.17	31.8
1	910	5.23	34.663	27.40	2.00	28	2.26	2.23	33.9
2	1195	4.34	34.642	27.48	2.13	30	2.22	2.22	32.1
2	1385	3.87	34.680	27.56	2.37	33	2.22	2.22	29.7
2	1870	2.64	34.744	27.73	2.98	40	2.18	2.14	34.5
2	2358	2.09	34.741	27.78	3.46	45	2.10	2.07	32.1
2	2850	1.69	34.733	27.80	3.65	47	2.04	1.99	29.4
2	3338	1.44	34.726	27.81	3.93	51	2.04	2.05	30.0
2	3825	1.20	34.721	27.83	4.18	54	2.02	1.99	29.7
2	4315	1.13	34.720	27.83	4.28	55	1.94	2.06	27.3
2	4800	1.19	34.720	27.83	4.38	56	1.94	1.93	29.7

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 17/63	26/ 1/63	2030 H	09 20 S	110 00 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	WIRE ANGLES CAST2
1209	25.6	26.2	29	05	15	8	4	4	*	3	29	4	1007.2	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	27.69	33.577	21.44	***	***	***	***	***
2	20	27.72	33.586	21.43	***	***	***	***	***
2	40	27.68	33.578	21.44	***	***	***	***	***
2	60	27.72	33.570	21.44	***	***	***	***	***
2	80	27.70	33.582	21.44	***	***	***	***	***
2	120	27.67	33.598	21.46	***	***	***	***	***
2	147	27.10	33.645	21.68	***	***	***	***	***
2	225	21.46	34.821	23.71	***	***	***	***	***
2	240	12.60	34.572	26.15	***	***	***	***	***

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 18/63	28/ 1/63	0630 H	09 00 S	105 00 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	WIRE ANGLES CAST2
6258	25.6	27.2	21	05	15	4	3	6	*	3	27	4	1008.0	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
3	0	27.29	33.800	21.73	4.46	100	0.13	0.33	00.5
3	25	27.32	33.784	21.71	4.47	100	0.13	***	00.3
3	49	27.42	34.255	22.03	4.34	98	0.15	0.34	00.3
3	74	26.59	34.455	22.45	4.05	90	0.31	***	01.1
3	98	23.31	34.635	23.58	2.71	57	0.77	0.86	11.1
3	122	19.58	34.617	24.59	2.51	49	0.97	***	15.4
3	147	16.84	34.574	25.24	2.47	46	1.16	***	19.0
3	193	13.59	34.595	25.97	2.16	37	1.41	1.51	24.6
3	241	11.34	34.623	26.44	2.04	34	1.60	***	27.0
3	288	10.83	34.795	26.66	1.69	27	1.69	1.81	19.2
3	382	9.55	34.736	26.84	2.06	33	1.78	***	29.7
3	477	8.67	34.723	26.97	2.00	31	1.89	1.93	31.5
3	660	7.05	34.697	27.19	1.63	24	2.11	2.23	34.2
3	840	6.11	34.643	27.27	1.90	28	2.18	2.33	35.4
2	947	5.24	34.652	27.39	1.94	28	2.17	2.20	35.4
2	1123	4.56	34.657	27.47	2.12	30	2.19	2.33	36.0
2	1355	4.00	34.693	27.56	2.27	31	2.21	2.30	36.6
2	1817	2.80	34.746	27.72	2.92	39	2.16	2.19	36.0
2	2287	2.17	34.746	27.77	3.23	42	2.11	2.07	33.6
2	2763	1.76	34.734	27.80	3.64	47	2.01	2.12	35.1
1	3365	1.42	34.725	27.81	3.97	51	1.95	2.12	34.5
1	3900	1.16	34.720	27.83	4.22	54	1.95	1.98	33.3
1	4395	1.18	34.719	27.83	4.34	56	1.91	2.02	33.6
1	4895	1.19	34.719	27.82	4.35	56	1.90	1.98	32.1
1	5390	1.20	34.719	27.82	4.35	56	1.89	1.93	27.6
1	5885	1.30	34.719	27.80	4.40	57	1.90	1.93	33.0

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 19/63	7/ 2/63	0430 H	08 59 S	105 01 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	WIRE ANGLES CAST2
6258	25.4	27.4	35	02	15	4	2	6	*	2	32	1	1009.2	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
3	0	27.47	33.808	21.68	4.50	101	0.11	0.27	00.0
3	23	27.64	33.810	21.63	4.48	101	0.11	***	00.0
3	46	27.44	33.837	21.71	4.45	100	0.11	0.23	00.0
3	69	27.42	34.637	22.32	3.75	85	0.27	***	00.4
3	92	23.24	34.621	23.59	2.73	57	0.74	0.88	07.4
3	115	19.64	34.640	24.59	2.39	47	0.99	***	14.4
3	138	17.20	34.612	25.18	2.37	44	1.17	***	16.2
3	186	14.57	34.583	25.76	2.36	42	1.31	1.40	20.4
3	231	12.17	34.613	26.27	2.25	38	1.51	***	23.1
3	276	11.03	34.718	26.56	1.81	30	1.68	1.83	28.5
3	370	9.84	34.723	26.78	2.02	32	***	***	28.5
3	467	8.62	34.731	26.98	1.92	30	1.88	1.96	30.9
3	654	7.23	34.706	27.17	1.64	24	2.11	2.15	34.2
3	845	5.78	34.634	27.31	1.91	27	2.15	2.20	34.2
2	1037	5.02	34.655	27.42	1.98	28	2.16	2.20	36.0
2	1228	4.24	34.672	27.52	2.19	30	2.18	2.23	35.1
2	1425	3.74	34.712	27.60	2.36	32	2.17	2.20	33.0
2	1915	2.64	34.747	27.73	3.01	40	2.11	2.14	33.9
2	2405	2.01	34.743	27.78	3.36	44	2.04	2.04	36.0
2	2895	1.68	34.734	27.80	3.70	48	2.02	2.00	33.9
1	3296	1.45	34.728	27.81	3.94	51	1.99	2.00	36.3
1	3778	1.20	34.722	27.83	4.16	53	1.93	1.91	34.5
1	4263	1.16	***	***	4.31	***	1.91	1.98	35.4
1	4748	1.17	34.720	27.83	4.36	56	1.91	1.96	35.1
1	5233	1.19	34.720	27.83	4.37	56	1.87	2.00	33.6
1	5712	1.27	34.720	27.82	4.40	57	1.87	1.98	31.5

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 20/63	8/ 2/63	0830 H	09 30 S	110 00 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	WIRE ANGLES CAST2
1236	24.9	26.1	28	02	15	8	5	6	*	2	25	1	1010.7	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	27.43	33.512	21.47	4.50	101	0.12	0.22	00.2
1	24	27.46	33.670	21.58	4.52	102	0.13	***	00.1
1	47	27.26	33.821	21.76	4.47	100	0.12	0.30	00.3
1	71	27.11	34.075	22.00	4.31	96	0.15	***	00.6
1	93	25.64	34.492	22.77	4.37	96	0.21	0.34	00.5
1	117	20.81	34.539	24.21	3.01	60	0.82	***	10.5
1	140	18.19	34.542	24.89	2.83	54	0.99	***	12.6
1	186	14.55	34.567	25.75	2.43	43	1.25	1.39	20.6
1	232	12.03	34.562	26.26	2.30	39	1.51	***	23.3
1	277	10.88	34.600	26.50	2.13	35	1.60	1.71	26.2
1	368	10.27	34.831	26.79	1.61	26	1.78	***	28.9
1	460	8.99	34.753	26.94	1.74	27	1.88	2.02	32.0
1	643	7.13	34.696	27.18	1.71	25	2.10	2.20	36.1
1	830	5.86	34.636	27.30	1.89	27	2.16	2.25	40.3
1	1020	4.91	34.639	27.42	2.03	29	2.15	2.20	36.8

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 21/63	8/ 2/63	2030 H	11 00 S	110 00 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	WIRE ANGLES CAST2
5092	24.4	26.1	28	03	15	8	4	6	*	2	27	1	1009.4	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	27.73	34.363	22.01	***	***	***	***	***
1	24	27.63	34.372	22.05	***	***	***	***	***
1	48	26.42	34.856	22.80	***	***	***	***	***
1	72	25.28	34.581	22.95	***	***	***	***	***
1	95	23.19	34.619	23.60	***	***	***	***	***
1	143	18.22	34.544	24.88	***	***	***	***	***
1	190	15.07	34.564	25.63	***	***	***	***	***
1	284	10.80	34.604	26.52	***	***	***	***	***
1	470	8.28	34.646	26.97	***	***	***	***	***

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 22/63	9/ 2/63	0830 H	12 30 S	110 00 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	WIRE ANGLES CAST2
4667	24.5	26.2	25	03	15	5	8	6	*	3	20	4	1008.0	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
2	0	27.94	34.476	22.03	4.38	100	0.10	0.24	00.6
2	25	27.74	34.463	22.08	4.48	102	0.13	***	00.2
2	50	24.46	34.574	23.19	4.19	90	0.24	0.33	00.6
2	75	23.12	34.648	23.64	3.56	75	0.46	***	03.9
2	100	21.25	34.696	24.21	2.97	60	0.75	0.85	07.5
2	125	19.42	34.785	24.76	2.66	52	0.89	***	10.6
2	149	16.54	34.710	25.41	2.46	45	1.17	***	14.1
2	198	13.93	34.673	25.96	2.32	41	1.28	1.43	18.9
2	247	12.11	34.647	26.31	2.33	39	1.47	***	21.5
2	297	11.34	34.819	26.59	2.79	46	1.28	1.42	20.1
2	396	9.28	34.659	26.82	2.19	34	1.75	***	27.7
2	495	8.39	34.665	26.97	2.08	32	1.86	1.91	30.3
2	693	6.61	34.622	27.19	1.97	29	2.05	2.12	34.9
2	890	5.50	34.626	27.34	1.99	28	2.14	2.22	34.9
2	1088	4.70	34.636	27.43	1.96	28	2.04	2.18	39.5
1	1275	4.15	34.645	27.51	2.22	31	2.22	2.29	36.2
1	1474	3.51	34.692	27.61	2.48	34	2.17	2.22	39.5
1	1970	2.52	34.739	27.74	3.10	41	2.12	2.15	36.0
1	2468	1.95	34.738	27.78	3.43	45	2.02	2.04	36.8
1	2967	***	34.731	***	3.74	***	1.99	2.05	34.6
1	3465	1.37	34.724	27.82	4.01	52	1.93	1.99	34.9
1	3964	1.19	34.720	27.83	4.14	53	1.93	1.99	32.7
1	4462	1.15	34.718	27.83	4.36	56	1.91	1.91	34.1

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 23/63	9/ 2/63	2030 H	14 00 S	110 00 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	WIRE ANGLES CAST2
5676	23.4	27.8	00	00	15	4	7	6	*	2.	22	1	1007.2	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	28.36	34.469	21.89	***	***	***	***	***
1	25	28.41	34.459	21.86	***	***	***	***	***
1	50	27.94	34.617	22.14	***	***	***	***	***
1	75	25.27	34.508	22.90	***	***	***	***	***
1	100	23.47	34.561	23.48	***	***	***	***	***
1	150	18.25	34.606	24.92	***	***	***	***	***
1	200	15.21	34.658	25.68	***	***	***	***	***
1	300	12.43	34.858	26.41	***	***	***	***	***
1	500	8.85	34.708	26.93	***	***	***	***	***

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 24/63	10/ 2/63	0830 H	15 30 S	110 00 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	WIRE ANGLES CAST2
5676	23.9	27.8	14	03	15	6	2	6	*	2	16	1	1009.1	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
2	0	27.69	34.606	22.21	4.45	101	0.13	0.24	00.7
2	25	26.72	35.066	22.87	4.55	102	0.13	***	00.3
2	50	24.01	34.941	23.61	4.69	100	0.15	0.32	00.5
2	75	23.25	35.117	23.96	4.71	99	0.15	***	00.3
2	100	21.05	34.774	24.32	3.13	63	0.71	0.81	08.1
2	125	20.28	35.007	24.70	3.08	61	0.73	***	08.1
2	150	18.89	35.022	25.08	2.91	56	0.79	***	09.1
2	200	15.61	34.839	25.73	2.56	46	1.10	1.18	17.1
2	248	13.79	34.894	26.16	2.76	48	1.20	***	17.1
2	297	12.15	34.859	26.47	2.79	47	1.32	1.44	20.7
2	396	***	34.787	***	3.26	***	1.40	***	21.9
2	495	8.78	34.704	26.94	4.51	71	1.27	1.36	18.2
2	694	6.62	34.650	27.21	2.11	31	2.02	2.15	36.8
2	892	5.41	34.635	27.35	1.95	28	2.23	2.31	40.8
2	1090	4.69	34.660	27.46	2.02	28	2.22	2.26	37.6
1	1271	4.09	34.658	27.52	2.27	31	2.20	2.30	37.1
1	1468	3.53	34.678	27.60	2.62	36	2.20	2.38	39.2
1	1960	2.42	34.726	27.74	3.10	41	2.12	2.18	39.2
1	2453	1.96	34.734	27.78	3.49	46	2.11	2.09	33.5
1	2948	1.61	34.729	27.80	3.74	48	1.99	2.08	37.1
1	3444	1.36	34.723	27.82	4.08	53	1.99	2.04	34.6
1	3940	1.23	34.720	27.82	4.20	54	1.94	1.99	36.5
1	4437	1.15	34.719	27.83	4.26	55	1.92	2.04	34.6
1	4934	1.17	34.718	27.82	4.45	57	1.95	1.98	34.1

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 25/63	10/ 2/63	2030 H	17 00 S	110 00 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	WIRE ANGLES CAST2
5631	23.2	27.2	11	02	15	1	3	6	*	2	19	1	***	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	27.45	34.770	22.41	***	***	***	***	***
1	25	27.19	34.820	22.53	***	***	***	***	***
1	50	23.46	34.988	23.80	***	***	***	***	***
1	75	21.37	34.660	24.15	***	***	***	***	***
1	100	21.35	35.029	24.43	***	***	***	***	***
1	150	19.53	35.271	25.10	***	***	***	***	***
1	200	16.31	35.193	25.84	***	***	***	***	***
1	300	12.63	35.164	26.61	***	***	***	***	***
1	500	8.51	34.663	26.95	***	***	***	***	***

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 26/63	11/ 2/63	0830 H	18 30 S	110 00 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	WIRE ANGLES CAST2
5092	23.3	26.7	13	02	15	2	6	6	*	2	19	1	1011.0	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
2	0	27.42	35.038	22.62	4.49	102	0.14	0.30	00.4
2	25	27.34	35.053	22.66	4.54	103	0.13	***	00.2
2	50	24.52	35.026	23.52	4.80	104	0.15	0.27	00.3
2	75	22.81	35.089	24.07	4.46	93	0.22	***	00.6
2	100	22.13	35.169	24.32	4.49	93	0.22	0.36	00.3
2	125	21.01	35.208	24.66	4.02	81	0.39	***	02.0
2	150	20.55	35.197	24.78	3.70	74	0.49	***	04.2
2	200	18.92	35.345	25.32	3.59	70	0.64	0.66	04.9
2	250	17.00	35.332	25.78	3.48	65	0.76	***	08.3
2	300	15.38	35.529	26.31	3.98	72	0.57	0.66	05.7
2	400	***	35.316	***	4.74	***	0.66	***	05.4
2	500	10.79	35.339	27.09	3.69	61	0.66	0.75	06.3
2	700	7.67	34.618	27.04	2.74	42	1.88	2.05	32.2
3	892	5.53	34.641	27.35	1.98	28	2.22	2.33	36.0
3	1091	4.83	34.645	27.43	2.10	29	2.20	2.31	36.8
1	1293	4.16	34.655	27.51	2.39	33	2.12	2.22	36.8
1	1491	3.55	34.670	27.59	2.71	37	2.20	2.20	43.1
1	1985	2.44	34.724	27.73	3.20	42	2.11	2.12	43.1
1	2480	1.95	34.736	27.78	3.47	45	2.11	2.14	36.2
1	2978	1.59	34.731	27.81	3.77	49	1.99	2.10	33.5
1	3476	1.34	34.724	27.82	4.10	53	2.02	2.05	34.1
1	3975	1.21	34.720	27.82	4.19	54	1.98	2.02	36.0
1	4474	1.15	34.718	27.83	4.30	55	1.96	1.96	32.7
1	4973	1.18	34.716	27.82	4.41	57	1.96	1.94	33.3

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 27/63	11/ 2/63	2030 H	20 00 S	110 00 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	WIRE ANGLES CAST2
3842	23.8	26.3	15	05	15	8	4	7	*	3	16	4	1011.3	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
1	0	27.40	34.894	22.52	***	***	***	***	***
1	25	27.43	34.895	22.51	***	***	***	***	***
1	50	26.77	34.847	22.69	***	***	***	***	***
1	75	25.05	34.854	23.23	***	***	***	***	***
1	100	24.17	34.920	23.54	***	***	***	***	***
1	150	22.15	35.084	24.25	***	***	***	***	***
1	200	19.90	35.096	24.87	***	***	***	***	***
1	300	15.68	35.409	26.15	***	***	***	***	***
1	500	9.62	34.789	26.87	***	***	***	***	***

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 28/63	12/ 2/63	0830 H	21 26 S	110 01 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	WIRE ANGLES CAST2
5073	22.2	26.1	15	06	15	8	5	7	*	4	16	4	1012.4	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
2	0	26.12	35.079	23.07	4.58	102	0.13	0.26	00.4
2	25	26.14	35.082	23.06	4.60	102	0.13	***	00.1
2	50	23.09	35.098	23.99	4.73	100	0.17	0.34	00.1
2	75	22.16	35.178	24.32	4.61	95	0.21	***	00.1
2	100	21.71	35.284	24.53	4.59	94	0.24	0.34	00.0
2	150	***	35.482	***	4.18	***	0.36	***	02.1
2	200	18.49	35.562	25.59	3.87	75	0.49	0.58	04.8
2	300	14.93	35.507	26.39	4.49	81	0.52	0.63	04.5
2	486	9.74	34.795	26.86	5.38	87	0.90	1.00	12.5
2	694	6.70	34.508	27.09	4.27	63	1.60	1.66	26.3
2	891	5.55	34.612	27.32	2.20	32	2.16	2.28	36.2
2	1089	4.68	34.630	27.44	2.21	31	2.17	2.22	37.3
1	1269	4.17	34.639	27.50	2.44	34	2.14	2.35	36.8
1	1460	3.51	34.659	27.58	2.75	37	2.18	2.30	36.8
1	1945	2.46	34.717	27.73	3.29	44	2.16	2.17	36.8
1	2433	1.99	34.732	27.78	3.48	46	2.04	2.10	34.1
1	2925	1.67	34.728	27.80	3.81	49	2.02	2.10	32.2
1	3420	1.38	34.724	27.82	4.07	52	1.98	2.12	34.1
1	3914	1.17	34.717	27.82	4.22	54	1.97	1.97	33.3
1	4408	1.18	34.716	27.82	4.34	56	1.96	2.04	34.1

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 30/63	13/ 2/63	0930 H	24 15 S	109 58 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	WIRE ANGLES CAST2
4411	22.8	24.7	16	06	15	8	6	7	*	4	16	4	1010.2	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
2	0	25.31	35.166	23.38	4.60	101	0.11	0.27	00.5
2	23	25.42	35.168	23.35	4.62	101	0.13	***	00.4
2	45	23.66	35.146	23.86	4.68	100	0.16	0.26	00.3
2	68	21.48	35.314	24.61	4.52	93	0.22	***	00.4
2	90	20.75	35.358	24.85	3.97	80	0.37	0.48	03.4
2	135	19.87	35.511	25.20	3.98	79	0.40	***	04.0
2	176	19.36	35.699	25.47	4.39	87	0.27	0.36	02.7
2	597	7.68	34.584	27.01	4.71	72	1.39	1.42	17.0
2	760	5.34	34.538	27.29	2.99	43	2.01	2.09	22.4
2	920	4.91	34.616	27.40	2.25	32	2.17	2.25	25.1
1	960	4.99	34.624	27.40	2.18	31	2.20	2.33	22.7
1	1128	4.14	34.624	27.49	2.55	35	2.20	2.23	26.9
1	1552	2.91	34.656	27.64	3.10	42	2.18	2.20	26.1
1	1970	2.36	34.717	27.73	3.26	43	2.10	2.08	25.5
1	2400	1.98	34.728	27.77	3.59	47	2.08	2.10	25.4
1	2840	1.66	34.732	27.80	3.87	50	1.99	2.05	25.5
1	3289	1.35	34.723	27.82	4.03	52	2.03	2.02	24.9
1	3736	1.22	34.720	27.82	4.22	54	2.01	2.02	27.4

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 31/63	14/ 2/63	0830 H	27 33 S	110 00 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	WIRE ANGLES CAST2
5641	22.2	24.4	15	06	15	*	0	7	*	4	15	4	1011.2	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
2	0	23.57	35.591	24.23	4.79	102	0.11	0.25	00.3
2	22	23.53	35.600	24.25	4.80	102	0.11	***	00.2
2	43	22.60	35.641	24.55	4.80	101	0.13	0.30	00.2
2	65	20.18	35.758	25.30	5.13	103	0.16	***	00.2
2	85	19.50	35.718	25.45	4.98	99	0.16	0.25	00.1
2	133	18.43	35.832	25.81	4.87	95	0.22	***	00.8
2	162	17.40	35.827	26.06	4.82	92	0.22	0.33	02.3
2	237	15.54	35.705	26.41	5.03	92	0.29	0.37	02.7
2	396	10.39	34.901	26.82	5.45	89	0.78	0.94	10.8
2	560	8.88	34.669	26.89	5.41	85	1.10	1.12	14.9
2	723	6.64	34.477	27.07	4.57	68	1.51	1.57	23.8
2	893	4.67	34.501	27.34	3.22	45	2.02	2.03	29.9
1	1187	3.91	34.570	27.47	3.02	42	2.18	2.16	29.9
1	1364	3.59	34.605	27.53	2.98	41	2.14	2.19	29.5
1	1800	2.62	34.716	27.71	3.29	44	2.07	2.11	30.5
1	2252	2.16	34.729	27.76	3.57	47	2.02	2.08	30.0
1	2718	1.82	34.735	27.79	3.70	48	2.02	2.01	28.7
1	3188	1.55	34.732	27.81	3.97	51	1.99	2.01	27.0
1	3659	1.36	34.730	27.82	4.10	53	1.93	1.95	27.1
1	4129	1.18	34.723	27.83	4.27	55	1.91	2.01	27.6
1	4603	1.15	34.721	27.83	4.46	57	1.91	2.01	26.9

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 33/63	15/ 2/63	0830 H	30 25 S	110 00 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	WIRE ANGLES CAST2
5385	21.1	22.8	15	05	15	*	0	7	*	4	15	4	1012.3	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
2	0	20.91	35.913	25.22	5.06	103	0.09	0.26	00.2
2	25	20.90	35.936	25.24	5.07	103	0.11	***	00.2
2	50	20.88	35.927	25.24	4.99	102	0.10	0.24	00.2
2	75	20.84	35.927	25.25	5.04	102	0.11	***	00.0
2	100	20.48	35.907	25.34	4.99	101	0.11	0.24	00.0
2	150	18.20	35.800	25.85	5.19	100	0.14	***	00.0
2	200	16.32	35.701	26.22	5.01	93	0.23	0.41	01.0
2	300	9.53	34.779	26.87	5.40	86	1.07	1.08	14.4
2	500	6.61	34.471	27.07	4.64	69	1.50	1.60	23.4
2	698	4.82	34.403	27.24	4.35	62	1.78	1.91	23.7
2	896	3.88	34.453	27.38	3.78	52	1.98	2.08	26.7
2	1094	3.39	34.526	27.49	3.48	47	1.98	2.10	25.5
1	1266	3.03	34.585	27.57	3.47	47	2.04	2.16	25.5
1	1463	2.87	34.640	27.63	3.45	46	2.09	2.17	26.4
1	1955	2.28	34.715	27.74	3.71	49	2.01	2.12	26.1
1	2448	1.95	34.729	27.78	3.82	50	1.96	2.04	26.7
1	2944	1.66	34.732	27.80	3.94	51	1.95	2.02	25.5
1	3442	1.43	34.730	27.82	4.28	55	1.90	2.02	26.7
1	3940	1.24	34.722	27.82	4.39	56	1.90	2.02	26.7
1	4440	1.10	34.717	27.83	4.48	57	1.93	2.02	26.7
1	4940	1.05	34.715	27.83	4.69	60	1.91	1.93	27.6

G 1/ 35/63 16/ 2/63 0800 H 32 00 S 111 50 E

SONIC DEPTH	AIR TEMP. WET	AIR TEMP. DRY	WIND DIR.	WIND SP.	ANEM. HEIGHT	CLOUD TYPE	CLOUD AMT.	VIS.	SEA DIR.	SEA AMT.	SWELL DIR.	SWELL AMT.	ATMOS. PRESSURE	WIRE ANGLES CAST1	WIRE ANGLES CAST2
5002	17.7	21.3	15	06	15	6	7	6	15	3	15	4	1010.8	*	*

CAST	DEPTH	TEMP.	SALINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	INORG. P	TOTAL P	NITRATE
3	0	23.45	35.456	24.16	4.75	101	0.16	0.22	00.3
3	25	23.59	35.466	24.13	4.76	101	0.13	***	00.1
3	50	20.70	35.856	25.26	5.08	103	0.13	0.24	00.2
3	75	20.17	35.861	25.38	5.16	104	0.13	***	00.1
3	100	16.39	35.827	26.30	5.58	104	0.22	0.54	00.0
3	150	14.51	35.541	26.51	5.41	97	0.36	***	01.2
3	200	13.10	35.304	26.62	5.45	95	0.47	0.62	03.7
3	300	11.04	34.981	26.77	5.64	93	0.74	0.74	09.2
3	500	9.09	34.691	26.88	5.55	88	1.03	1.05	16.8
3	698	7.84	34.553	26.96	5.05	77	1.37	1.15	20.7
3	898	4.86	34.396	27.23	4.39	62	1.80	1.77	26.4
4	1068	3.94	***	***	***	***	***	***	11.1
1	1292	3.26	34.547	27.52	3.53	48	2.06	***	26.4
2	1491	2.82	34.604	27.60	3.51	47	2.02	***	26.7
2	1988	2.34	34.716	27.73	3.62	48	2.04	***	26.1
2	2485	***	34.734	***	3.81	***	1.99	***	26.4
2	2983	1.64	34.734	27.80	4.08	53	1.93	1.93	26.1
2	3480	1.36	34.727	27.82	4.23	54	1.96	1.93	26.1
2	3978	1.19	34.721	27.83	4.29	55	1.93	1.90	26.1
2	4475	1.13	34.718	27.83	4.53	58	1.93	1.91	26.1

DATA

PART 2

PRIMARY PRODUCTION

EXPLANATION OF HEADINGS

Part 2	Primary Production
STATION	Gives the station identification, for example, G1/2/63 signifies the 2nd station worked from Gascoyne in 1963 on her 1st cruise for that year
DATE	Given as day/month/year
TIME	Given in Zone Time (Table 2, p.16)
LATITUDE LONGITUDE	Given in degrees and minutes
INCUBATION METHOD	IN SITU: Incubation in situ
	SIMULATED IN SITU: Incubation in a simulated in situ incubator using sunlight and blue glass filters
	ARTIFICIAL CONSTANT LIGHT: Incubation in artificial constant light of 1100 ft candles
ACTIVITY CPM	Activity of the ^{14}C stock used, in counts per minute
BACKGROUND	Activity in counts per minute
DEPTH	Depth of sampling in metres
LIGHT	The counts per minute of the filter from the clear bottle
DARK	The counts per minute of the filter from the dark bottle. If this is more than 50 and also more than 10% of the LIGHT count, it is assumed to be aberrant and the symbol "B" is placed after it

DARK USED	Usually the same as DARK. However, if DARK is aberrant or not done, the mean of the other DARK counts at that station which are not aberrant is used, and the symbol "E" placed after it. If all the other DARK counts are aberrant an arbitrary count of 20 is used and the symbol "F" is placed after it
NETT	LIGHT minus DARK USED. If this is negative it is assumed to be equal to zero for further calculations and the symbol "G" is placed after it
INC.PER.	Incubation period
PRODUCTION A	For artificial constant light this is the calculated rate of production at the depth sampled per hour of incubation. For in situ and simulated in situ it is the production per day, and this is assumed to be twice the production from noon to sunset
PRODUCTION B	The integrated rate of production per day under one square metre of sea surface from the surface to the depth given. For artificial constant light, the production per day is assumed to equal 10 times the hourly production
**	Indicates no data available

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 1/63	18/ 1/63	1100 H	32 00 S	111 52 E

INCUBATION METHOD	PERIOD	14C STOCK	ACTIVITY CPM	BACKGROUND
ARTIFICIAL CONSTANT LIGHT	4 HOURS	NO. 11	8.38 MILLION	10 CPM

DEPTH M	LIGHT CPM	DARK CPM	DARK USED CPM	NETT CPM	INC. PER. HOURS	PRODUCTION A MG.C/HR./CU.M.	PRODUCTION B G.C/DAY/SQ.M.
0	28	3	3	25	04.00	00.02	00.00
25	45	12	12	33	04.00	00.02	00.01
50	42	9	9	33	04.00	00.02	00.02
75	31	11	11	20	04.00	00.01	00.02
100	18	10	10	8	04.00	00.01	00.02
150	6	16	16	- 10 G	04.00	00.00	00.02

G NEGATIVE VALUE, ASSUMED ZERO

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 2/63	19/ 1/63	0815 H	32 00 S	110 00 E

INCUBATION METHOD	PERIOD	14C STOCK	ACTIVITY CPM	BACKGROUND
ARTIFICIAL CONSTANT LIGHT	4 HOURS	NO. 11	8.38 MILLION	10 CPM

DEPTH M	LIGHT CPM	DARK CPM	DARK USED CPM	NETT CPM	INC. PER. HOURS	PRODUCTION A MG.C/HR./CU.M.	PRODUCTION B G.C/DAY/SQ.M.
0	12	6	6	6	04.00	00.00	00.00
25	26	12	12	14	04.00	00.01	00.00
50	22	5	5	17	04.00	00.01	00.00
75	16	7	7	9	04.00	00.01	00.00
100	17	6	6	11	04.00	00.01	00.00
150	9	3	3	6	04.00	00.00	00.00

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 2/63	19/ 1/63	1145 H	32 00 S	110 00 E

INCUBATION METHOD	PERIOD	14C STOCK	ACTIVITY CPM	BACKGROUND
SIMULATED IN SITU	NOON - SUNSET	NO. 11	8.38 MILLION	10 CPM

DEPTH M	LIGHT CPM	DARK CPM	DARK USED CPM	NETT CPM	INC. PER. DAYS	PRODUCTION A MG.C/DAY/CU.M.	PRODUCTION B G.C/DAY/SQ.M.
0	177	18	18	159	00.50	00.93	00.00
21	289	39	39	250	00.50	01.46	00.03
32	259	29	29	230	00.50	01.35	00.05
44	220	20	20	200	00.50	01.17	00.07
60	122	68 B	27 E	95	00.50	00.56	00.08
72	75	32	32	43	00.50	00.25	00.08

B ABERRANT VALUE, NOT USED
E MEAN NON-ABERRANT DARK USED

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 3/63	19/ 1/63	2015 H	30 32 S	110 01 E

INCUBATION METHOD	PERIOD	14C STOCK	ACTIVITY CPM	BACKGROUND
ARTIFICIAL CONSTANT LIGHT	4 HOURS	NO. 11	8.38 MILLION	10 CPM

DEPTH M	LIGHT CPM	DARK CPM	DARK USED CPM	NETT CPM	INC. PER. HOURS	PRODUCTION A MG.C/HR./CU.M.	PRODUCTION B G.C/DAY/SQ.M.
0	33	20	20	13	04.00	00.01	00.00
25	30	21	21	9	04.00	00.01	00.00
50	25	17	17	8	04.00	00.01	00.00
75	13	18	18	- 5 G	04.00	00.00	00.00
100	18	20	20	- 2 G	04.00	00.00	00.00
150	17	13	13	4	04.00	00.00	00.00

G NEGATIVE VALUE, ASSUMED ZERO

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 4/63	20/ 1/63	0815 H	29 00 S	110 00 E

INCUBATION METHOD	PERIOD	14C STOCK	ACTIVITY CPM	BACKGROUND
ARTIFICIAL CONSTANT LIGHT	4 HOURS	NO. 11	8.38 MILLION	10 CPM

DEPTH M	LIGHT CPM	DARK CPM	DARK USED CPM	NETT CPM	INC. PER. HOURS	PRODUCTION A MG.C/HR./CU.M.	PRODUCTION B G.C/DAY/SQ.M.
0	55	19	19	36	04.00	00.03	00.00
25	97	27	27	70	04.00	00.05	00.01
50	93	18	18	75	04.00	00.05	00.02
75	26	15	15	11	04.00	00.01	00.03
100	46	12	12	34	04.00	00.02	00.03
150	10	6	6	4	04.00	00.00	00.04

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 4/63	20/ 1/63	1215 H	29 00 S	110 00 E

INCUBATION METHOD	PERIOD	14C STOCK	ACTIVITY CPM	BACKGROUND
SIMULATED IN SITU	NOON - SUNSET	NO. 11	8.38 MILLION	10 CPM

DEPTH M	LIGHT CPM	DARK CPM	DARK USED CPM	NETT CPM	INC. PER. DAYS	PRODUCTION A MG.C/DAY/CU.M.	PRODUCTION B G.C/DAY/SQ.M.
0	267	19	19	248	00.50	01.45	00.00
16	470	23	23	447	00.50	02.62	00.03
28	328	26	26	302	00.50	01.77	00.06
48	210	39	39	171	00.50	01.00	00.09
61	127	35	35	92	00.50	00.54	00.10
85	87	29	29	58	00.50	00.34	00.11

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 5/63	20/ 1/63	2045 H	27 30 S	110 00 E

INCUBATION METHOD	PERIOD	14C STOCK	ACTIVITY CPM	BACKGROUND
ARTIFICIAL CONSTANT LIGHT	4 HOURS	NO. 11	8.38 MILLION	10 CPM

DEPTH M	LIGHT CPM	DARK CPM	DARK USED CPM	NETT CPM	INC. PER. HOURS	PRODUCTION A MG.C/HR./CU.M.	PRODUCTION B G.C/DAY/SQ.M.
0	31	45	45	- 14 G	04.00	00.00	00.00
25	27	16	16	11	04.00	00.01	00.00
50	21	12	12	9	04.00	00.01	00.00
75	23	14	14	9	04.00	00.01	00.00
100	17	10	10	7	04.00	00.01	00.00
150	16	9	9	7	04.00	00.01	00.01

G NEGATIVE VALUE, ASSUMED ZERO

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 6/63	21/ 1/63	0900 H	26 00 S	110 00 E

INCUBATION METHOD	PERIOD	14C STOCK	ACTIVITY CPM	BACKGROUND
ARTIFICIAL CONSTANT LIGHT	4 HOURS	NO. 11	8.38 MILLION	10 CPM

DEPTH M	LIGHT CPM	DARK CPM	DARK USED CPM	NETT CPM	INC. PER. HOURS	PRODUCTION A MG.C/HR./CU.M.	PRODUCTION B G.C/DAY/SQ.M.
0	54	40	40	14	04.00	00.01	00.00
25	48	18	18	30	04.00	00.02	00.00
50	21	15	15	6	04.00	00.00	00.00
75	15	13	13	2	04.00	00.00	00.00
100	12	12	12	0	04.00	00.00	00.00
150	17	12	12	5	04.00	00.00	00.00

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 7/63	22/ 1/63	0115 H	24 50 S	109 59 E

INCUBATION METHOD	PERIOD	14C STOCK	ACTIVITY CPM	BACKGROUND
ARTIFICIAL CONSTANT LIGHT	4 HOURS	NO. 11	8.38 MILLION	10 CPM

DEPTH M	LIGHT CPM	DARK CPM	DARK USED CPM	NETT CPM	INC. PER. HOURS	PRODUCTION A MG.C/HR./CU.M.	PRODUCTION B G.C/DAY/SQ.M.
0	15	27	27	- 12 G	04.00	00.00	00.00
25	23	28	28	- 5 G	04.00	00.00	00.00
50	18	18	18	0	04.00	00.00	00.00
75	15	9	9	6	04.00	00.00	00.00
100	11	11	11	0	04.00	00.00	00.00
150	8	11	11	- 3 G	04.00	00.00	00.00

G NEGATIVE VALUE, ASSUMED ZERO

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 8/63	22/ 1/63	0915 H	23 17 S	110 04 E

INCUBATION METHOD	PERIOD	14C STOCK	ACTIVITY CPM	BACKGROUND
ARTIFICIAL CONSTANT LIGHT	4 HOURS	NO. 11	8.38 MILLION	10 CPM

DEPTH M	LIGHT CPM	DARK CPM	DARK USED CPM	NETT CPM	INC. PER. HOURS	PRODUCTION A MG.C/HR./CU.M.	PRODUCTION B G.C/DAY/SQ.M.
0	25	25	25	0	04.00	00.00	00.00
25	34	23	23	11	04.00	00.01	00.00
50	24	9	9	15	04.00	00.01	00.00
75	31	17	17	14	04.00	00.01	00.00
100	22	6	6	16	04.00	00.01	00.00
150	9	12	12	- 3 G	04.00	00.00	00.00

G NEGATIVE VALUE, ASSUMED ZERO

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 9/63	22/ 1/63	2045 H	21 30 S	110 00 E

INCUBATION METHOD	PERIOD	14C STOCK	ACTIVITY CPM	BACKGROUND
ARTIFICIAL CONSTANT LIGHT	4 HOURS	NO. 11	8.38 MILLION	10 CPM

DEPTH M	LIGHT CPM	DARK CPM	DARK USED CPM		NETT CPM		INC. PER. HOURS	PRODUCTION A MG.C/HR./CU.M.	PRODUCTION B G.C/DAY/SQ.M.
0	7	21	21	-	14	G	04.00	00.00	00.00
25	16	15	15		1		04.00	00.00	00.00
50	11	17	17	-	6	G	04.00	00.00	00.00
75	12	9	9		3		04.00	00.00	00.00
100	12	7	7		5		04.00	00.00	00.00
150	6	14	14	-	8	G	04.00	00.00	00.00

G NEGATIVE VALUE, ASSUMED ZERO

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 10/63	23/ 1/63	0900 H	20 00 S	110 00 E

INCUBATION METHOD	PERIOD	14C. STOCK	ACTIVITY CPM	BACKGROUND
ARTIFICIAL CONSTANT LIGHT	4 HOURS	NO. 11	8.38 MILLION	10 CPM

DEPTH M	LIGHT CPM	DARK CPM	DARK USED CPM	NETT CPM	INC. PER. HOURS	PRODUCTION A MG.C/HR./CU.M.	PRODUCTION B G.C/DAY/SQ.M.
0	60	30	30	30	04.00	00.02	00.00
25	119	74	18	101	04.00	00.07	00.01
50	43	16	16	27	04.00	00.02	00.02
75	37	21	21	16	04.00	00.01	00.02
100	14	8	8	6	04.00	00.00	00.02
150	40	15	15	25	04.00	00.02	00.03

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 10/63	23/ 1/63	1250 H	20 00 S	110 00 E

INCUBATION METHOD	PERIOD	14C STOCK	ACTIVITY CPM	BACKGROUND
SIMULATED IN SITU	NOON - SUNSET	NO. 11	8.38 MILLION	10 CPM

DEPTH M	LIGHT CPM	DARK CPM	DARK USED CPM	NETT CPM	INC. PER. DAYS	PRODUCTION A MG.C/DAY/CU.M.	PRODUCTION B G.C/DAY/SQ.M.
0	180	56 B	26 E	154	00.50	00.90	00.00
16	258	26	26	232	00.50	01.36	00.02
29	325	29	29	296	00.50	01.73	00.04
46	152	56 B	26 E	126	00.50	00.74	00.06
59	165	24	24	141	00.50	00.83	00.07
74	150	52 B	26 E	124	00.50	00.73	00.08

B ABERRANT VALUE, NOT USED
E MEAN NON-ABERRANT DARK USED

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 11/63	23/ 1/63	2050 H	18 30 S	110 00 E

INCUBATION METHOD	PERIOD	14C STOCK	ACTIVITY CPM	BACKGROUND
ARTIFICIAL CONSTANT LIGHT	4 HOURS	NO. 11	8.38 MILLION	10 CPM

DEPTH	LIGHT	DARK	DARK USED	NETT	INC. PER.	PRODUCTION A	PRODUCTION B
M	CPM	CPM	CPM	CPM	HOURS	MG.C/HR./CU.M.	G.C/DAY/SQ.M.
0	6	21	21	- 15 G	04.00	00.00	00.00
25	16	27	27	- 11 G	04.00	00.00	00.00
50	9	11	11	- 2 G	04.00	00.00	00.00
75	18	13	13	5	04.00	00.00	00.00
100	14	5	5	9	04.00	00.01	00.00
150	14	14	14	0	04.00	00.00	00.00

G NEGATIVE VALUE, ASSUMED ZERO

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 12/63	24/ 1/63	0850 H	17 00 S	110 00 E

INCUBATION METHOD	PERIOD	14C STOCK	ACTIVITY CPM	BACKGROUND
ARTIFICIAL CONSTANT LIGHT	4 HOURS	NO. 11	8.38 MILLION	10 CPM

DEPTH M	LIGHT CPM	DARK CPM	DARK USED CPM	NETT CPM	INC. PER. HOURS	PRODUCTION A MG.C/HR./CU.M.	PRODUCTION B G.C/DAY/SQ.M.
0	22	21	21	1	04.00	00.00	00.00
25	30	40	40	- 10 G	04.00	00.00	00.00
50	19	9	9	10	04.00	00.01	00.00
75	26	17	17	9	04.00	00.01	00.00
100	3	7	7	- 4 G	04.00	00.00	00.00
150	6	20	20	- 14 G	04.00	00.00	00.00

G NEGATIVE VALUE, ASSUMED ZERO

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 13/63	24/ 1/63	2050 H	15 44 S	110 00 E

INCUBATION METHOD	PERIOD	14C STOCK	ACTIVITY CPM	BACKGROUND
ARTIFICIAL CONSTANT LIGHT	4 HOURS	NO. 11	8.38 MILLION	10 CPM

DEPTH M	LIGHT CPM	DARK CPM	DARK USED CPM	NETT CPM	INC. PER. HOURS	PRODUCTION A MG.C/HR./CU.M.	PRODUCTION B G.C/DAY/SQ.M.
0	11	11	11	0	04.00	00.00	00.00
25	12	15	15	- 3 G	04.00	00.00	00.00
50	20	15	15	5	04.00	00.00	00.00
75	10	12	12	- 2 G	04.00	00.00	00.00
100	8	18	18	- 10 G	04.00	00.00	00.00
150	9	15	15	- 6 G	04.00	00.00	00.00

G NEGATIVE VALUE, ASSUMED ZERO

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 14/63	2/ 1/63	0850 H	14 01 S	110 03 E

INCUBATION METHOD	PERIOD	14C STOCK	ACTIVITY CPM	BACKGROUND
ARTIFICIAL CONSTANT LIGHT	4 HOURS	NO. 11	8.38 MILLION	10 CPM

DEPTH M	LIGHT CPM	DARK CPM	DARK USED CPM	NETT CPM	INC. PER. HOURS	PRODUCTION A MG.C/HR./CU.M.	PRODUCTION B G.C/DAY/SQ.M.
0	68	15	15	53	04.00	00.04	00.00
25	76	28	28	48	04.00	00.04	00.01
50	164	18	18	146	04.00	00.11	00.03
75	37	48	48	- 11 G	04.00	00.00	00.04
100	16	16	16	0	04.00	00.00	00.04
150	8	12	12	- 4 G	04.00	00.00	00.04

G NEGATIVE VALUE, ASSUMED ZERO

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 14/63	25/ 1/63	1250 H	14 01 S	110 03 E

INCUBATION METHOD	PERIOD	14C STOCK	ACTIVITY CPM	BACKGROUND
SIMULATED IN SITU	NOON - SUNSET	NO. 11	8.38 MILLION	10 CPM

DEPTH	LIGHT	DARK	DARK USED	NETT	INC. PER.	PRODUCTION A	PRODUCTION B
M	CPM	CPM	CPM	CPM	DAYS	MG.C/DAY/CU.M.	G.C/DAY/SQ.M.
0	252	44	44	208	00.50	01.22	00.00
14	227	21	21	206	00.50	01.21	00.02
23	205	25	25	180	00.50	01.05	00.03
35	92	60 B	30 E	62	00.50	00.36	00.04
47	133	26	26	107	00.50	00.63	00.05
65	91	34	34	57	00.50	00.33	00.06

B ABERRANT VALUE, NOT USED
E MEAN NON-ABERRANT DARK USED

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 15/63	25/ 1/63	2100 H	12 30 S	110 00 E

INCUBATION METHOD	PERIOD	14C STOCK	ACTIVITY CPM	BACKGROUND
ARTIFICIAL CONSTANT LIGHT	4 HOURS	NO. 11	8.38 MILLION	10 CPM

DEPTH M	LIGHT CPM	DARK CPM	DARK USED CPM	NETT CPM	INC. PER. HOURS	PRODUCTION A MG.C/HR./CU.M.	PRODUCTION B G.C/DAY/SQ.M.
0	12	16	16	- 4 G	04.00	00.00	00.00
25	21	11	11	10	04.00	00.01	00.00
50	13	9	9	4	04.00	00.00	00.00
75	27	9	9	18	04.00	00.01	00.00
100	8	3	3	5	04.00	00.00	00.00
150	5	10	10	- 5 G	04.00	00.00	00.00

G NEGATIVE VALUE, ASSUMED ZERO

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 16/63	26/ 1/63	0900 H	10 50 S	109 58 E

INCUBATION METHOD	PERIOD	14C STOCK	ACTIVITY CPM	BACKGROUND
ARTIFICIAL CONSTANT LIGHT	4 HOURS	NO. 11	8.38 MILLION	10 CPM

DEPTH M	LIGHT CPM	DARK CPM	DARK USED CPM	NETT CPM	INC. PER. HOURS	PRODUCTION A MG.C/HR./CU.M.	PRODUCTION B G.C/DAY/SQ.M.
0	44	14	14	30	04.00	00.02	00.00
25	69	16	16	53	04.00	00.04	00.01
50	56	51 B	23 E	33	04.00	00.02	00.02
75	29	48	48	- 19 G	04.00	00.00	00.02
100	8	27	27	- 19 G	04.00	00.00	00.02
150	21	13	13	8	04.00	00.01	00.02

B ABERRANT VALUE, NOT USED
E MEAN NON-ABERRANT DARK USED
G NEGATIVE VALUE, ASSUMED ZERO

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 16/63	26/ 1/63	1245 H	10 50 S	109 58 E

INCUBATION METHOD	PERIOD	14C STOCK	ACTIVITY CPM	BACKGROUND
SIMULATED IN SITU	NOON - SUNSET	NO. 11	8.38 MILLION	10 CPM

DEPTH M	LIGHT CPM	DARK CPM	DARK USED CPM	NETT CPM	INC. PER. DAYS	PRODUCTION A MG.C/DAY/CU.M.	PRODUCTION B G.C/DAY/SQ.M.
0	388	195 B	20 F	368	00.50	02.16	00.00
8	384	70 B	20 F	364	00.50	02.13	00.02
30	394	112 B	20 F	374	00.50	02.19	00.07
52	291	128 B	20 F	271	00.50	01.59	00.11
66	254	79 B	20 F	234	00.50	01.37	00.13
74	197	232 B	20 F	177	00.50	01.04	00.14

B ABERRANT VALUE, NOT USED
F ARBITRARY DARK USED

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 17/63	26/ 1/63	2100 H	09 20 S	110 00 E

INCUBATION METHOD	PERIOD	14C STOCK	ACTIVITY CPM	BACKGROUND
ARTIFICIAL CONSTANT LIGHT	4 HOURS	NO. 11	8.38 MILLION	10 CPM

DEPTH M	LIGHT CPM	DARK CPM	DARK USED CPM	NETT CPM		INC. PER. HOURS	PRODUCTION A MG.C/HR./CU.M.	PRODUCTION B G.C/DAY/SQ.M.
0	24	15	15	9		04.00	00.01	00.00
25	34	30	30	4		04.00	00.00	00.00
50	40	14	14	26		04.00	00.02	00.00
75	35	13	13	22		04.00	00.02	00.01
100	46	12	12	34		04.00	00.02	00.02
150	8	10	10	2	G	04.00	00.00	00.03

G NEGATIVE VALUE, ASSUMED ZERO

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 18/63	28/ 1/63	0900 H	09 00 S	105 00 E

INCUBATION METHOD	PERIOD	14C STOCK	ACTIVITY CPM	BACKGROUND
ARTIFICIAL CONSTANT LIGHT	4 HOURS	NO. 11	8.38 MILLION	10 CPM

DEPTH M	LIGHT CPM	DARK CPM	DARK USED CPM	NETT CPM	INC. PER. HOURS	PRODUCTION A MG.C/HR./CU.M.	PRODUCTION B G.C/DAY/SQ.M.
0	88	15	15	73	04.00	00.05	00.00
25	118	20	20	98	04.00	00.07	00.02
50	125	17	17	108	04.00	00.08	00.04
75	20	16	16	4	04.00	00.00	00.05
100	25	11	11	14	04.00	00.01	00.05
150	16	15	15	1	04.00	00.00	00.05

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 18/63	28/ 1/63	1245 H	09 00 S	105 00 E

INCUBATION METHOD	PERIOD	14C STOCK	ACTIVITY CPM	BACKGROUND
IN SITU	NOON - SUNSET	NO. 11	8.38 MILLION	10 CPM

DEPTH M	LIGHT CPM	DARK CPM	DARK USED CPM	NETT CPM	INC. PER. DAYS	PRODUCTION A MG.C/DAY/CU.M.	PRODUCTION B G.C/DAY/SQ.M.
0	201	40	40	161	00.50	00.94	00.00
25	732	39	39	693	00.50	04.06	00.06
50	914	50	50	864	00.50	05.06	00.18
75	415	34	34	381	00.50	02.23	00.27
100	48	14	14	34	00.50	00.20	00.30
150	20	11	11	9	00.50	00.05	00.30

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 19/63	7/ 2/63	0700 H	08 59 S	105 01 E

INCUBATION METHOD	PERIOD	14C STOCK	ACTIVITY CPM	BACKGROUND
ARTIFICIAL CONSTANT LIGHT	4 HOURS	NO. 11	8.38 MILLION	10 CPM

DEPTH M	LIGHT CPM	DARK CPM	DARK USED CPM	NETT CPM	INC. PER. HOURS	PRODUCTION A MG.C/HR./CU.M.	PRODUCTION B G.C/DAY/SQ.M.
0	81	12	12	69	04.00	00.05	00.00
25	92	13	13	79	04.00	00.06	00.01
50	99	**	15 E	84	04.00	00.06	00.03
75	35	18	18	17	04.00	00.01	00.04
100	47	20	20	27	04.00	00.02	00.04
150	10	16	16	- 6 G	04.00	00.00	00.05

E MEAN NON-ABERRANT DARK USED
G NEGATIVE VALUE, ASSUMED ZERO

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 20/63	8/ 2/63	0845 H	09 30 S	110 00 E

INCUBATION METHOD	PERIOD	14C STOCK	ACTIVITY CPM	BACKGROUND
ARTIFICIAL CONSTANT LIGHT	4 HOURS	NO. 11	8.38 MILLION	10 CPM

DEPTH M	LIGHT CPM	DARK CPM	DARK USED CPM	NETT CPM	INC. PER. HOURS	PRODUCTION A MG.C/HR./CU.M.	PRODUCTION B G.C/DAY/SQ.M.
0	149	12	12	137	04.00	00.10	00.00
25	168	21	21	147	04.00	00.11	00.03
50	91	10	10	81	04.00	00.06	00.05
75	39	18	18	21	04.00	00.02	00.06
100	21	8	8	13	04.00	00.01	00.06
150	82	14	14	68	04.00	00.05	00.08

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 21/63	8/ 2/63	2100 H	11 00 S	110 00 E

INCUBATION METHOD	PERIOD	14C STOCK	ACTIVITY CPM	BACKGROUND
ARTIFICIAL CONSTANT LIGHT	4 HOURS	NO. 11	8.38 MILLION	10 CPM

DEPTH M	LIGHT CPM	DARK CPM	DARK USED CPM	NETT CPM	INC. PER. HOURS	PRODUCTION A MG.C/HR./CU.M.	PRODUCTION B G.C/DAY/SQ.M.
0	19	19	19	0	04.00	00.00	00.00
25	22	7	7	15	04.00	00.01	00.00
50	21	11	11	10	04.00	00.01	00.00
75	18	14	14	4	04.00	00.00	00.00
100	19	13	13	6	04.00	00.00	00.00
150	6	6	6	0	04.00	00.00	00.00

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 22/63	9/ 2/63	0900 H	12 30 S	110 00 E

INCUBATION METHOD	PERIOD	14C STOCK	ACTIVITY CPM	BACKGROUND
ARTIFICIAL CONSTANT LIGHT	4 HOURS	NO. 11	8.38 MILLION	10 CPM

DEPTH M	LIGHT CPM	DARK CPM	DARK USED CPM	NETT CPM	INC. PER. HOURS	PRODUCTION A MG.C/HR./CU.M.	PRODUCTION B G.C/DAY/SQ.M.
0	48	6	6	42	04.00	00.03	00.00
25	90	11	11	79	04.00	00.06	00.01
50	54	7	7	47	04.00	00.03	00.02
75	27	11	11	16	04.00	00.01	00.03
100	5	12	12	- 7 G	04.00	00.00	00.03
150	6	10	10	- 4 G	04.00	00.00	00.03

G NEGATIVE VALUE, ASSUMED ZERO

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 23/63	9/ 2/63	2050 H	14 00 S	110 00 E

INCUBATION METHOD	PERIOD	14C STOCK	ACTIVITY CPM	BACKGROUND
ARTIFICIAL CONSTANT LIGHT	4 HOURS	NO. 11	8.38 MILLION	10 CPM

DEPTH	LIGHT	DARK	DARK USED	NETT		INC. PER.	PRODUCTION A	PRODUCTION B
M	CPM	CPM	CPM	CPM		HOURS	MG.C/HR./CU.M.	G.C/DAY/SQ.M.
0	14	16	16	- 2	G	04.00	00.00	00.00
25	28	19	19	9		04.00	00.01	00.00
50	24	10	10	14		04.00	00.01	00.00
75	63	20	20	43		04.00	00.03	00.01
100	7	12	12	- 5	G	04.00	00.00	00.01
150	7	12	12	- 5	G	04.00	00.00	00.01

G NEGATIVE VALUE, ASSUMED ZERO

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 24/63	10/ 2/63	0850 H	15 30 S	110 00 E

INCUBATION METHOD	PERIOD	14C. STOCK	ACTIVITY CPM	BACKGROUND
ARTIFICIAL CONSTANT LIGHT	4 HOURS	NO. 11	8.38 MILLION	10 CPM

DEPTH	LIGHT	DARK	DARK USED	NETT	INC. PER.	PRODUCTION A	PRODUCTION B
M	CPM	CPM	CPM	CPM	HOURS	MG.C/HR./CU.M.	G.C/DAY/SQ.M.
0	72	16	16	56	04.00	00.04	00.00
25	88	16	16	72	04.00	00.05	00.01
50	52	7	7	45	04.00	00.03	00.02
75	21	14	14	7	04.00	00.01	00.03
100	13	9	9	4	04.00	00.00	00.03
150	6	13	13	- 7 G	04.00	00.00	00.03

G NEGATIVE VALUE, ASSUMED ZERO

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 25/63	10/ 2/63	2045 H	17 00 S	110 00 E

INCUBATION METHOD	PERIOD	14C STOCK	ACTIVITY CPM	BACKGROUND
ARTIFICIAL CONSTANT LIGHT	4 HOURS	NO. 11	8.38 MILLION	10 CPM

DEPTH M	LIGHT CPM	DARK CPM	DARK USED CPM	NETT CPM	INC. PER. HOURS	PRODUCTION A MG.C/HR./CU.M.	PRODUCTION B G.C/DAY/SQ.M.
0	15	15	15	0	04.00	00.00	00.00
25	27	16	16	11	04.00	00.01	00.00
50	64	16	16	48	04.00	00.04	00.01
75	15	11	11	4	04.00	00.00	00.02
100	7	10	10	- 3 G	04.00	00.00	00.02
150	10	11	11	- 1 G	04.00	00.00	00.02

G NEGATIVE VALUE, ASSUMED ZERO

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 26/63	11/ 2/63	0850 H	18 30 S	110 00 E

INCUBATION METHOD	PERIOD	14C. STOCK	ACTIVITY CPM	BACKGROUND
ARTIFICIAL CONSTANT LIGHT	4 HOURS	NO. 11	8.38 MILLION	10 CPM

DEPTH	LIGHT	DARK	DARK USED	NETT	INC. PER.	PRODUCTION A	PRODUCTION B
M	CPM	CPM	CPM	CPM	HOURS	MG.C/HR./CU.M.	G.C/DAY/SQ.M.
0	62	11	11	51	04.00	00.04	00.00
25	101	17	17	84	04.00	00.06	00.01
50	78	12	12	66	04.00	00.05	00.02
75	24	13	13	11	04.00	00.01	00.03
100	11	12	12	- 1 G	04.00	00.00	00.03
150	8	13	13	- 5 G	04.00	00.00	00.03

G NEGATIVE VALUE, ASSUMED ZERO

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 27/63	11/ 2/63	2050 H	20 00 S	110 00 E

INCUBATION METHOD	PERIOD	14C STOCK	ACTIVITY CPM	BACKGROUND
ARTIFICIAL CONSTANT LIGHT	4 HOURS	NO. 11	8.38 MILLION	10 CPM

DEPTH M	LIGHT CPM	DARK CPM	DARK USED CPM	NETT CPM	INC. PER. HOURS	PRODUCTION A MG.C/HR./CU.M.	PRODUCTION B G.C/DAY/SQ.M.
0	27	19	19	8	04.00	00.01	00.00
25	32	16	16	16	04.00	00.01	00.00
50	67	17	17	50	04.00	00.04	00.01
75	20	19	19	1	04.00	00.00	00.02
100	12	9	9	3	04.00	00.00	00.02
150	5	16	16	- 11 G	04.00	00.00	00.02

G NEGATIVE VALUE, ASSUMED ZERO

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 28/63	12/ 2/63	0900 H	21 26 S	110 01 E

INCUBATION METHOD	PERIOD	14C STOCK	ACTIVITY CPM	BACKGROUND
ARTIFICIAL CONSTANT LIGHT	4 HOURS	NO. 11	8.38 MILLION	10 CPM

DEPTH M	LIGHT CPM	DARK CPM	DARK USED CPM	NETT CPM	INC. PER. HOURS	PRODUCTION A MG.C/HR./CU.M.	PRODUCTION B G.C/DAY/SQ.M.
0	69	16	16	53	04.00	00.04	00.00
25	139	18	18	121	04.00	00.09	00.02
50	96	15	15	81	04.00	00.06	00.04
75	32	16	16	16	04.00	00.01	00.05
100	23	13	13	10	04.00	00.01	00.05
150	7	11	11	- 4 G	04.00	00.00	00.05

G NEGATIVE VALUE, ASSUMED ZERO

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 29/63	12/ 2/63	2100 H	23 10 S	110 00 E

INCUBATION METHOD	PERIOD	14C STOCK	ACTIVITY CPM	BACKGROUND
ARTIFICIAL CONSTANT LIGHT	4 HOURS	NO. 11	8.38 MILLION	10 CPM

DEPTH M	LIGHT CPM	DARK CPM	DARK USED CPM	NETT CPM	INC. PER. HOURS	PRODUCTION A MG.C/HR./CU.M.	PRODUCTION B G.C/DAY/SQ.M.
0	18	21	21	- 3 G	04.00	00.00	00.00
25	39	17	17	22	04.00	00.02	00.00
50	25	12	12	13	04.00	00.01	00.00
75	25	13	13	12	04.00	00.01	00.00
100	11	7	7	4	04.00	00.00	00.00
150	7	13	13	- 6 G	04.00	00.00	00.00

G NEGATIVE VALUE, ASSUMED ZERO

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 30/63	13/ 2/63	1010 H	24 15 S	109 58 E

INCUBATION METHOD	PERIOD	14C STOCK	ACTIVITY CPM	BACKGROUND
ARTIFICIAL CONSTANT LIGHT	4 HOURS	NO. 11	8.38 MILLION	10 CPM

DEPTH M	LIGHT CPM	DARK CPM	DARK USED CPM	NETT CPM	INC. PER. HOURS	PRODUCTION A MG.C/HR./CU.M.	PRODUCTION B G.C/DAY/SQ.M.
0	105	22	22	83	04.00	00.06	00.00
25	195	13	13	182	04.00	00.13	00.02
50	183	11	11	172	04.00	00.13	00.05
75	72	13	13	59	04.00	00.04	00.07
100	27	6	6	21	04.00	00.02	00.08
150	13	13	13	0	04.00	00.00	00.09

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 31/63	14/ 2/63	0900 H	27 33 S	110 00 E

INCUBATION METHOD	PERIOD	14C STOCK	ACTIVITY CPM	BACKGROUND
ARTIFICIAL CONSTANT LIGHT	4 HOURS	NO. 11	8.38 MILLION	10 CPM

DEPTH M	LIGHT CPM	DARK CPM	DARK USED CPM	NETT CPM	INC. PER. HOURS	PRODUCTION A MG.C/HR./CU.M.	PRODUCTION B G.C/DAY/SQ.M.
0	58	22	22	36	04.00	00.03	00.00
25	83	13	13	70	04.00	00.05	00.01
50	196	10	10	186	04.00	00.14	00.03
75	39	7	7	32	04.00	00.02	00.05
100	13	7	7	6	04.00	00.00	00.05
150	9	18	18	- 9 G	04.00	00.00	00.05

G NEGATIVE VALUE, ASSUMED ZERO

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 32/63	14/ 2/63	2055 H	28 55 S	110 00 E

INCUBATION METHOD	PERIOD	14C STOCK	ACTIVITY CPM	BACKGROUND
ARTIFICIAL CONSTANT LIGHT	4 HOURS	NO. 11	8.38 MILLION	10 CPM

DEPTH M	LIGHT CPM	DARK CPM	DARK USED CPM	NETT CPM	INC. PER. HOURS	PRODUCTION A MG.C/HR./CU.M.	PRODUCTION B G.C/DAY/SQ.M.
0	41	17	17	24	04.00	00.02	00.00
25	43	20	20	23	04.00	00.02	00.01
50	34	25	25	9	04.00	00.01	00.01
75	43	18	18	25	04.00	00.02	00.01
100	20	25	25	- 5 G	04.00	00.00	00.01
150	6	15	15	- 9 G	04.00	00.00	00.01

G NEGATIVE VALUE, ASSUMED ZERO

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 33/63	15/ 2/63	0900 H	30 25 S	110 00 E

INCUBATION METHOD	PERIOD	14C STOCK	ACTIVITY CPM	BACKGROUND
ARTIFICIAL CONSTANT LIGHT	4 HOURS	NO. 11	8.38 MILLION	15 CPM

DEPTH M	LIGHT CPM	DARK CPM	DARK USED CPM	NETT CPM	INC. PER. HOURS	PRODUCTION A MG.C/HR./CU.M.	PRODUCTION B G.C/DAY/SQ.M.
0	96	31	31	65	04.00	00.05	00.00
25	217	27	27	190	04.00	00.14	00.02
50	221	35	35	186	04.00	00.14	00.06
75	57	20	20	37	04.00	00.03	00.08
100	39	27	27	12	04.00	00.01	00.09
150	16	15	15	1	04.00	00.00	00.09

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 34/63	15/ 2/63	2050 H	32 00 S	110 00 E

INCUBATION METHOD	PERIOD	14C STOCK	ACTIVITY CPM	BACKGROUND
ARTIFICIAL CONSTANT LIGHT	4 HOURS	NO. 11	8.38 MILLION	15 CPM

DEPTH M	LIGHT CPM	DARK CPM	DARK USED CPM	NETT CPM	INC. PER. HOURS	PRODUCTION A MG.C/HR./CU.M.	PRODUCTION B G.C/DAY/SQ.M.
0	70	29	29	41	04.00	00.03	00.00
25	67	33	33	34	04.00	00.02	00.01
50	82	17	17	65	04.00	00.05	00.02
75	22	19	19	3	04.00	00.00	00.03
100	26	9	9	17	04.00	00.01	00.03
150	14	15	15	- 1 G	04.00	00.00	00.03

G NEGATIVE VALUE, ASSUMED ZERO

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 35/63	16/ 2/63	0900 H	32 00 S	111 50 E

INCUBATION METHOD	PERIOD	14C STOCK	ACTIVITY CPM	BACKGROUND
ARTIFICIAL CONSTANT LIGHT	4 HOURS	NO. 11	8.38 MILLION	15 CPM

DEPTH M	LIGHT CPM	DARK CPM	DARK USED CPM	NETT CPM	INC. PER. HOURS	PRODUCTION A MG.C/HR./CU.M.	PRODUCTION B G.C/DAY/SQ.M.
0	85	15	15	70	04.00	00.05	00.00
25	164	24	24	140	04.00	00.10	00.02
50	148	9	9	139	04.00	00.10	00.05
75	54	16	16	38	04.00	00.03	00.07
100	56	6	6	50	04.00	00.04	00.08
150	22	19	19	3	04.00	00.00	00.09

DATA

PART 3

PIGMENTS

EXPLANATION OF HEADINGS

Part 3	Pigments
STATION	Gives the station identification, for example, G1/2/63 signifies the 2nd station worked from Gascoyne in 1963, on her 1st cruise for that year
DATE	Given as day/month/year
TIME	Given in Zone Time (Table 2, p. 16)
LATITUDE LONGITUDE	Given in degrees and minutes
DEPTH	Actual sampling depth given in metres
CHLOROPHYLL A B C	A and B given in mg/m^3 C given in $MSPU/m^3$
ASTACIN NON-ASTACIN	Given in $MSPU/m^3$

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 1/63	18/ 1/63	0830 H	32 00 S	111 52 E

DEPTH	CHLOROPHYLL A	CHLOROPHYLL B	CHLOROPHYLL C	ASTACIN	NON-ASTACIN
0	0.06	0.05	0.19	0.03	0.02
25	0.05	0.03	0.11	0.03	0.01
50	0.10	0.08	0.34	0.07	0.00
75	0.15	0.12	0.48	0.09	0.00
100	0.21	0.14	0.70	0.10	0.00
150	0.11	0.09	0.45	0.07	0.00

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 2/63	19/ 1/63	0800 H	32 00 S	110 00 E

DEPTH	CHLOROPHYLL A	CHLOROPHYLL B	CHLOROPHYLL C	ASTACIN	NON-ASTACIN
0	0.11	0.06	0.78	0.09	- 0.01
25	0.06	0.02	0.25	0.04	0.01
50	0.07	0.02	0.12	0.05	0.01
75	0.18	0.14	0.68	0.12	- 0.01
100	0.17	0.08	0.33	0.04	0.04
150	0.06	0.04	0.43	0.07	0.00

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 3/63	19/ 1/63	2000 H	30 32 S	110 01 E

DEPTH	CHLOROPHYLL A	CHLOROPHYLL B	CHLOROPHYLL C	ASTACIN	NON-ASTACIN
0	0.07	0.07	0.29	0.06	0.00
25	0.06	0.04	0.31	0.05	0.02
50	0.07	0.08	0.32	0.07	0.00
75	0.13	0.09	0.52	0.09	- 0.01
100	0.14	0.09	0.42	0.07	0.00
150	0.13	0.09	0.61	0.09	0.00

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 4/63	20/ 1/63	0800 H	29 00 S	110 00 E

DEPTH	CHLOROPHYLL A	CHLOROPHYLL B	CHLOROPHYLL C	ASTACIN	NON-ASTACIN
0	0.07	0.08	0.23	0.04	0.01
25	0.08	0.02	0.28	0.05	0.01
50	0.06	0.06	0.20	0.05	0.00
75	0.10	0.07	0.26	0.04	0.02
100	0.26	0.20	0.65	0.09	0.01
150	0.09	0.05	0.24	0.04	0.02

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 5/63	20/ 1/63	2030 H	27 30 S	110 00 E

DEPTH	CHLOROPHYLL A	CHLOROPHYLL B	CHLOROPHYLL C	ASTACIN	NON-ASTACIN
0	0.09	0.05	0.45	0.06	0.01
25	0.05	0.06	0.21	0.06	0.01
50	0.06	0.06	0.20	0.05	0.01
75	0.34	0.22	0.80	0.09	0.03
100	0.22	0.16	0.33	0.04	0.06
150	0.06	0.04	0.29	0.03	0.02

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 6/63	21/ 1/63	0830 H	26 00 S	110 00 E

DEPTH	CHLOROPHYLL A	CHLOROPHYLL B	CHLOROPHYLL C	ASTACIN	NON-ASTACIN
0	0.10	0.07	0.46	0.08	- 0.01
25	0.09	0.05	0.30	0.05	0.01
50	0.07	0.03	0.29	0.07	- 0.02
75	0.09	0.05	0.30	0.04	0.03
100	0.17	0.12	0.40	0.07	0.01
150	0.12	0.09	0.38	0.05	0.03

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 7/63	21/ 1/63	2030 H	24 50 S	109 59 E

DEPTH	CHLOROPHYLL A	CHLOROPHYLL B	CHLOROPHYLL C	ASTACIN	NON-ASTACIN
0	0.07	0.03	0.24	0.04	0.01
25	0.07	0.03	0.25	0.05	0.01
50	0.06	0.05	0.32	0.05	0.02
75	0.12	0.08	0.48	0.09	0.00
100	0.16	0.11	0.51	0.09	0.00
150	0.16	0.15	0.50	0.08	0.03

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 8/63	22/ 1/63	0830 H	23 17 S	110 04 E

DEPTH	CHLOROPHYLL A	CHLOROPHYLL B	CHLOROPHYLL C	ASTACIN	NON-ASTACIN
0	0.08	0.02	0.28	0.05	0.00
25	0.07	0.02	0.12	0.04	0.01
50	0.04	0.00	- 0.01	0.01	0.06
75	0.30	0.09	0.45	0.05	0.08
100	0.47	0.17	0.83	0.04	0.19
150	0.15	0.06	0.31	0.04	0.05

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 9/63	22/ 1/63	2030 H	21 30 S	110 00 E

DEPTH	CHLOROPHYLL A	CHLOROPHYLL B	CHLOROPHYLL C	ASTACIN	NON-ASTACIN
0	0.05	0.07	0.26	0.05	0.00
25	0.05	0.04	0.29	0.06	0.00
50	0.11	0.05	0.37	0.06	0.02
75	0.16	0.01	0.51	0.02	0.07
100	0.31	0.14	0.68	0.06	0.11
150	0.05	0.06	0.32	0.06	0.00

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 10/63	23/ 1/63	0830 H	20 00 S	110 00 E

DEPTH	CHLOROPHYLL A	CHLOROPHYLL B	CHLOROPHYLL C	ASTACIN	NON-ASTACIN
0	0.06	0.03	0.24	0.05	0.01
25	0.06	0.01	0.26	0.05	0.01
50	0.11	0.07	0.39	0.06	0.01
75	0.48	0.16	0.85	0.06	0.14
100	0.27	0.12	0.64	0.05	0.11
150	0.07	0.03	0.26	0.05	0.01

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 11/63	23/ 1/63	2030 H	18 30 S	110 00 E

DEPTH	CHLOROPHYLL A	CHLOROPHYLL B	CHLOROPHYLL C	ASTACIN	NON-ASTACIN
0	0.10	0.09	0.42	0.08	0.00
25	0.04	0.01	0.25	0.04	0.01
50	0.17	0.01	0.24	0.02	0.11
75	0.33	0.23	0.76	0.09	0.04
100	0.22	0.20	0.68	0.09	0.01
150	0.06	0.05	0.36	0.07	0.00

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 12/63	24/ 1/63	0830 H	17 00 S	110 00 E

DEPTH	CHLOROPHYLL A	CHLOROPHYLL B	CHLOROPHYLL C	ASTACIN	NON-ASTACIN
0	0.06	0.03	0.48	0.05	0.00
25	0.09	0.03	0.15	0.04	0.06
50	0.12	0.02	0.20	0.03	0.04
75	0.28	0.11	0.46	0.04	0.07
100	0.21	0.11	0.31	0.03	0.08
150	0.03	0.01	0.07	0.03	0.02

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 13/63	24/ 1/63	2030 H	15 44 S	110 00 E

DEPTH	CHLOROPHYLL A	CHLOROPHYLL B	CHLOROPHYLL C	ASTACIN	NON-ASTACIN
0	0.02	0.00	- 0.01	0.00	0.03
25	0.07	0.05	0.32	0.06	- 0.01
50	0.13	0.05	0.31	0.05	0.03
75	0.35	0.09	0.66	0.04	0.12
100	0.27	0.12	0.55	0.05	0.09
150	0.06	0.02	0.27	0.05	0.01

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 14/63	25/ 1/63	0830 H	14 01 S	110 03 E

DEPTH	CHLOROPHYLL A	CHLOROPHYLL B	CHLOROPHYLL C	ASTACIN	NON-ASTACIN
0	0.06	0.03	0.18	0.02	0.03
25	0.09	0.03	0.18	0.04	0.01
50	0.14	0.05	0.35	0.05	0.01
75	0.19	0.04	0.39	0.04	0.03
100	0.28	0.12	0.53	0.05	0.08
150	0.15	0.12	0.82	0.10	- 0.02

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 15/63	25/ 1/63	2030 H	12 30 S	110 00 E

DEPTH	CHLOROPHYLL A	CHLOROPHYLL B	CHLOROPHYLL C	ASTACIN	NON-ASTACIN
0	0.07	0.03	0.31	0.05	0.00
25	0.06	0.03	0.27	0.05	0.01
50	0.13	0.06	0.18	0.04	0.03
75	0.43	0.29	0.83	0.07	0.09
100	0.19	0.09	0.24	0.00	0.12

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 16/63	26/ 1/63	0830 H	10 50 S	109 58 E

DEPTH	CHLOROPHYLL A	CHLOROPHYLL B	CHLOROPHYLL C	ASTACIN	NON-ASTACIN
0	0.08	0.03	0.13	0.02	0.04
25	0.08	0.00	0.15	0.02	0.04
50	0.13	0.05	0.26	0.05	0.02
75	0.39	0.26	0.79	0.07	0.08
100	0.16	0.10	0.29	0.01	0.09
150	0.08	0.04	0.32	0.05	0.01

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 17/63	26/ 1/63	2030 H	09 20 S	110 00 E

DEPTH	CHLOROPHYLL A	CHLOROPHYLL B	CHLOROPHYLL C	ASTACIN	NON-ASTACIN
0	0.18	0.02	0.26	0.02	0.08
25	0.17	0.02	0.04	0.01	0.08
50	0.17	0.04	0.17	0.01	0.07
75	0.21	0.04	0.09	0.00	0.11
100	0.24	0.02	0.26	0.01	0.10
150	0.02	0.01	0.08	0.00	0.03

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 18/63	28/ 1/63	0630 H	09 00 S	105 00 E

DEPTH	CHLOROPHYLL A	CHLOROPHYLL B	CHLOROPHYLL C	ASTACIN	NON-ASTACIN
0	0.12	0.00	0.07	0.01	0.06
25	0.10	0.06	0.25	0.02	0.04
50	0.13	0.03	0.11	0.01	0.06
75	0.24	0.10	0.53	0.05	0.08
100	0.11	0.08	0.21	0.01	0.08
150	0.06	0.04	0.28	0.06	0.00

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 19/63	7/ 2/63	0430 H	08 59 S	105 01 E

DEPTH	CHLOROPHYLL A	CHLOROPHYLL B	CHLOROPHYLL C	ASTACIN	NON-ASTACIN
0	0.11	0.06	0.59	0.08	- 0.01
25	0.13	0.05	0.46	0.07	0.00
50	0.13	0.06	0.39	0.08	- 0.01
75	0.33	0.16	0.89	0.12	0.02
100	0.21	0.12	0.90	0.10	0.00
150	0.10	0.07	0.45	0.08	- 0.01

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 20/63	8/ 2/63	0830 H	09 30 S	110 00 E

DEPTH	CHLOROPHYLL A	CHLOROPHYLL B	CHLOROPHYLL C	ASTACIN	NON-ASTACIN
0	0.14	0.09	0.72	0.09	- 0.01
25	0.14	0.08	0.44	0.08	0.00
50	0.20	0.07	0.63	0.08	0.02
75	0.38	0.12	0.84	0.08	0.07
100	0.26	0.10	0.68	0.05	0.06
150	0.17	0.09	0.58	0.09	0.00

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 21/63	8/ 2/63	2030 H	11 00 S	110 00 E

DEPTH	CHLOROPHYLL A	CHLOROPHYLL B	CHLOROPHYLL C	ASTACIN	NON-ASTACIN
0	0.10	0.04	0.41	0.05	0.00
25	0.10	0.08	0.38	0.07	0.00
50	0.18	0.06	0.59	0.07	0.01
75	0.33	0.12	0.61	0.03	0.13
100	0.26	0.12	0.70	0.07	0.07
150	0.05	0.03	0.25	0.03	0.00

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 22/63	9/ 2/63	0830 H	12 30 S	110 00 E

DEPTH	CHLOROPHYLL A	CHLOROPHYLL B	CHLOROPHYLL C	ASTACIN	NON-ASTACIN
0	0.09	0.03	0.20	0.02	0.03
25	0.11	0.05	0.44	0.06	0.00
50	0.17	0.08	0.50	0.08	0.00
75	0.45	0.19	1.02	0.10	0.11
100	0.21	0.10	0.67	0.07	0.05
150	0.05	0.03	0.25	0.04	0.00

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 23/63	9/ 2/63	2030 H	14 00 S	110 00 E

DEPTH	CHLOROPHYLL A	CHLOROPHYLL B	CHLOROPHYLL C	ASTACIN	NON-ASTACIN
0	0.01	0.00	0.00	0.02	0.04
25	0.08	0.04	0.21	0.03	0.02
50	0.10	0.04	0.23	0.03	0.03
75	0.25	0.11	0.24	0.10	0.02
100	0.30	0.11	0.84	0.04	0.11
150	0.08	0.06	0.31	0.04	0.00

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 24/63	10/ 2/63	0830 H	15 30 S	110 00 E

DEPTH	CHLOROPHYLL A	CHLOROPHYLL B	CHLOROPHYLL C	ASTACIN	NON-ASTACIN
0	0.12	0.07	0.45	0.07	0.00
25	0.10	0.07	0.45	0.07	0.00
50	0.12	0.04	0.48	0.07	0.00
75	0.17	0.09	0.83	0.08	0.00
100	0.41	0.20	1.07	0.12	0.07
150	0.09	0.07	0.39	0.07	0.00

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 25/63	10/ 2/63	2030 H	17 00 S	110 00 E

DEPTH	CHLOROPHYLL A	CHLOROPHYLL B	CHLOROPHYLL C	ASTACIN	NON-ASTACIN
0	0.07	0.02	0.29	0.02	0.02
25	0.11	0.02	0.28	0.03	0.02
50	0.26	0.07	0.45	0.05	0.09
75	0.30	0.15	0.82	0.08	0.08
100	0.22	0.13	0.72	0.08	0.04
150	0.09	0.07	0.35	0.07	0.00

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 26/63	11/ 2/63	0830 H	18 30 S	110 00 E

DEPTH	CHLOROPHYLL A	CHLOROPHYLL B	CHLOROPHYLL C	ASTACIN	NON-ASTACIN
0	0.08	0.07	0.57	0.06	0.00
25	0.12	0.07	0.45	0.07	0.00
50	0.11	0.09	0.65	0.06	0.00
75	0.19	0.07	0.72	0.08	0.00
100	0.26	0.07	0.51	0.03	0.12
150	0.05	0.02	0.20	0.02	0.03

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 27/63	11/ 2/63	2030 H	20 00 S	110 00 E

DEPTH	CHLOROPHYLL A	CHLOROPHYLL B	CHLOROPHYLL C	ASTACIN	NON-ASTACIN
0	0.04	0.02	0.07	0.01	0.03
25	0.05	0.00	0.15	0.01	0.04
50	0.03	0.00	0.00	0.00	0.06
75	0.10	0.03	0.22	0.01	0.06
100	0.18	0.07	0.37	0.03	0.07
150	0.13	0.08	0.46	0.06	0.02

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 28/63	12/ 2/63	0830 H	21 26 S	110 01 E

DEPTH	CHLOROPHYLL A	CHLOROPHYLL B	CHLOROPHYLL C	ASTACIN	NON-ASTACIN
0	0.05	0.01	0.12	0.02	0.02
25	0.04	0.00	0.15	0.02	0.02
50	0.06	0.00	0.28	0.02	0.04
75	0.15	0.07	0.68	0.08	0.00
100	0.19	0.06	0.34	0.02	0.08
150	0.06	0.01	0.12	0.01	0.04

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 29/63	12/ 2/63	2030 H	23 10 S	110 00 E

DEPTH	CHLOROPHYLL A	CHLOROPHYLL B	CHLOROPHYLL C	ASTACIN	NON-ASTACIN
0	0.09	0.05	0.26	0.03	0.02
25	0.08	0.03	0.32	0.03	0.02
50	0.04	0.02	0.16	0.01	0.07
75	0.31	0.16	0.50	0.04	0.12
100	0.22	0.09	0.66	0.04	0.09
150	0.08	0.01	0.47	0.04	0.01

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 30/63	13/ 2/63	0930 H	24 15 S	109 58 E

DEPTH	CHLOROPHYLL A	CHLOROPHYLL B	CHLOROPHYLL C	ASTACIN	NON-ASTACIN
0	0.10	0.04	0.17	0.03	0.03
25	0.08	0.04	0.23	0.03	0.03
50	0.14	0.09	0.34	0.05	0.01
75	0.41	0.10	0.69	0.04	0.24
100	0.40	0.11	0.75	0.07	0.18
150	0.06	0.03	0.25	0.03	0.01

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 31/63	14/ 2/63	0830 H	27 33 S	110 00 E

DEPTH	CHLOROPHYLL A	CHLOROPHYLL B	CHLOROPHYLL C	ASTACIN	NON-ASTACIN
0	0.14	0.09	0.78	0.08	- 0.01
25	0.13	0.06	0.44	0.06	0.00
50	0.15	0.07	0.53	0.07	0.00
75	0.14	0.06	0.34	0.04	0.03
100	0.28	0.07	0.59	0.02	0.16
150	0.03	0.00	0.03	0.01	0.03

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 32/63	14/ 2/63	2030 H	28 55 S	110 00 E

DEPTH	CHLOROPHYLL A	CHLOROPHYLL B	CHLOROPHYLL C	ASTACIN	NON-ASTACIN
0	0.07	0.04	0.25	0.05	0.00
25	0.06	0.04	0.26	0.03	0.01
50	0.09	0.04	0.39	0.05	0.01
75	0.20	0.07	0.21	0.04	0.07
100	0.19	0.13	0.25	0.03	0.09
150	0.07	0.04	0.30	0.05	0.00

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 33/63	15/ 2/63	0830 H	30 25 S	110 00 E

DEPTH	CHLOROPHYLL A	CHLOROPHYLL B	CHLOROPHYLL C	ASTACIN	NON-ASTACIN
0	0.07	0.01	0.13	0.01	0.05
25	0.11	0.06	0.40	0.04	0.03
50	0.09	0.02	0.19	0.02	0.05
75	0.14	0.02	0.14	0.01	0.09
100	0.17	0.04	0.24	0.02	0.07
150	0.19	0.05	0.39	0.02	0.09

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 34/63	15/ 2/63	2030 H	32 00 S	110 00 E

DEPTH	CHLOROPHYLL A	CHLOROPHYLL B	CHLOROPHYLL C	ASTACIN	NON-ASTACIN
0	0.07	0.05	0.03	0.04	0.00
25	0.12	0.07	0.75	0.08	0.00
50	0.10	0.03	0.36	0.03	0.02
75	0.19	0.08	0.66	0.08	0.01
100	0.22	0.04	0.24	0.01	0.17
150	0.01	0.00	0.00	0.00	0.04

STATION	DATE	TIME	LATITUDE	LONGITUDE
G 1/ 35/63	16/ 2/63	0800 H	32 00 S	111 50 E

DEPTH	CHLOROPHYLL A	CHLOROPHYLL B	CHLOROPHYLL C	ASTACIN	NON-ASTACIN
0	0.07	0.02	0.13	0.01	0.06
25	0.03	0.00	0.01	0.00	0.05
50	0.05	0.00	0.04	0.01	0.07
75	0.12	- 0.01	0.01	0.01	0.09
100	0.22	0.03	0.40	0.02	0.12
150	0.14	0.03	0.15	0.01	0.09

DATA

PART 4

ZOOPLANKTON

EXPLANATION OF SYMBOLS

Part 4	Zooplankton
x	Samples given to Indian Ocean Biological Centre, Cochin, India
*	Predominantly gelatinous organisms
( )	Including exceptionally large organisms
C.	Approximately
+	Sampler open during recovery

A blank indicates no data available

VERTICAL HAULS 200-0 m : INDIAN OCEAN STANDARD NET

STATION POSITION	DATE	TIME	ESTIMATED VOLUME FILTERED (m^3)	TOTAL WEIGHT (g)	BIOMASS (mg/m^3)
G1/1/63	18/1/63	1130	200	0.87	4
32°00'S. 111°52'E.		1230	200	2.37	12 x
G1/2/63	19/1/63	1030	200	2.87	14
32°00'S. 110°00'E.		1105	200	2.67	13 x
G1/3/63	19/1/63	2100	200	10.94	54
30°31.5'S.110°00'E.		2130	200	7.07	35 x
G1/4/63	20/1/63	1025	200	7.05	32
29°00'S. 110°00'E.		1055	200	7.06	35 x
G1/5/63	20/1/63	2035	200	8.27 (10.96)	41 (55)
27°30'S. 110°00'E.		2100	200	7.47	37 x
G1/8/63	22/1/63	0900	200	11.36	57
23°17'S. 110°04'E.		0930	200	10.71	54 x
G1/9/63	22/1/63	2040	200	8.87	44
21°30'S. 110°00'E.		2110	200	14.35 (18.46)	71 (92) x

VERTICAL HAULS 200-0 m : INDIAN OCEAN STANDARD NET

STATION POSITION	DATE	TIME	ESTIMATED VOLUME FILTERED (m^3)	TOTAL WEIGHT (g)	BIOMASS (mg/m^3)
G1/10/63	23/1/63	1025	200	5.58	28
20°00'S. 110°00'E.		1100	200	9.26	46 x
G1/11/63	23/1/63	2040	200	8.27 (9.74)	41 (48)
18°30'S. 110°00'E.		2110	200	6.94 (8.63)	35 (43) x
G1/12/63	24/1/63	1030	200	8.07	40
17°00'S. 110°00'E.		1100	200	10.94	55 x
G1/13/63	24/1/63	2035	243	12.09	50
15°44'S. 110°00'E.					
G1/14/63	25/1/63	1230	200	5.20	26
14°01'S. 110°03'E.		1250	200	4.36	22 x
G1/15/63	25/1/63	2035	200	7.45	37
12°30'S. 110°00'E.		2110	200	8.76 (12.97)	44 (64) x
G1/16/63	26/1/63	1230	200	4.29	21
10°50'S. 109°58'E.		1240	200	4.38	21 x

VERTICAL HAULS 200–0 m : INDIAN OCEAN STANDARD NET

STATION POSITION	DATE	TIME	ESTIMATED VOLUME FILTERED (m^3)	TOTAL WEIGHT (g)	BIOMASS (mg/m^3)
G1/18/63	28/1/63	1030	200	3.39	17
09°00'S. 105°00'E.		1115	200	5.29	21 x
G1/19/63	7/2/63	0750	200	6.14	30
08°59'S. 105°01'E.		0820	200	4.12	20 x
G1/20/63	8/2/63	1015	210	7.18	34
09°30'S. 110°00'E.		1100	210	3.72	19 x
G1/21/63	8/2/63	2055	200	37.27	186
11°00'S. 110°00'E.		2135	200	32.14	160 x
G1/22/63	9/2/63	1220	200	7.62	38
12°30'S. 110°00'E.		1250	200	7.16	35 x
G1/23/63	9/2/63	2030	200	13.77	68
14°00'S. 110°00'E.		2100	200	8.27	41 x
G1/24/63	10/2/63	1100	200	7.90	40
15°30'S. 110°00'E.		1215	200	6.03	30 x

VERTICAL HAULS 200-0 m : INDIAN OCEAN STANDARD NET

STATION POSITION	DATE	TIME	ESTIMATED VOLUME FILTERED (m^3)	TOTAL WEIGHT (g)	BIOMASS (mg/m^3)
G1/25/63	10/2/63	2030	200	22.23	111
17°00'S. 110°00'E.		2100	200	21.09	105 x
G1/26/63	11/2/63	1040	200	11.33	57
18°30'S. 110°00'E.		1115	200	12.85	64 x
G1/27/63	11/2/63	2030	200	12.47	62
20°00'S. 110°00'E.		2100	200	14.90	75 x
G1/28/63	12/2/63	1020	200	5.06	25
21°26'S. 110°01'E.		1050	200	7.31	37 x
G1/29/63	12/2/63	2000	200	6.34	31 x
23°10'S. 110°00'E.		2045	200	15.49	77
G1/30/63	13/2/63	1150	236	12.58	53
24°15'S. 109°58'E.		1220	236	8.46	36 x

VERTICAL HAULS 200-0 m : INDIAN OCEAN STANDARD NET

STATION POSITION	DATE	TIME	ESTIMATED VOLUME FILTERED (m^3)	TOTAL WEIGHT (g)	BIOMASS (mg/m^3)
G1/31/63	14/2/63	1035	245	11.85	48
27°33'S. 110°00'E.		1110	260	14.00	54 x
G1/32/63	14/2/63	2000	240	6.92	29
28°55'S. 110°00'E.		2030	230	11.76	51 x
G1/33/63	15/2/63	1045	222	7.29	33
30°25'S. 110°00'E.		1110	210	9.14	43 x
G1/34/63	15/2/63	2000	200	5.97	30
32°00'S. 110°00'E.		2025	200	9.14	46 x
G1/35/63	16/2/63	1120	221	5.85	26
32°00'S. 111°50'E.		1150	221	12.50	56 x

HORIZONTAL TOWS : CLARKE-BUMPUS SAMPLER

STATION POSITION	DATE	TIME	DEPTH STRATUM RANGE (m)	MODE (m)	FILTERED (m^3)	BIOMASS (mg/m^3)
G1/2/63	19/1/63	1214	0-10	0	22.9	5
32°00'S. 110°00'E.		"	55-65	60	22.4	23
		"	110-130	120	29.3	3
		"	225-300	225	32.5	7
G1/3/63	19/1/63	2147	0-10	0	12.2	63
30°31.5'S. 110°00'E.		"	50-0	35-50	25.4	27
		"	100-0	100	26.2	11
		"	200-0	150	37.8	14
G1/4/63	20/1/63	1108	0-10	0	17.3	27
29°00'S. 110°00'E.		"	40-75		16.2	33
		"	100-150		21.3	18
		"	150-300		25.4	9
G1/5/63	20/1/63	2130	0-10	0	23.9	8
27°30'S. 110°00'E.		"	35-50	40	28.6	46
		"	60-100	80	31.9	9
		"	150-220	160	40.6	20

HORIZONTAL TOWS : CLARKE-BUMPUS SAMPLER

STATION POSITION	DATE	TIME	DEPTH STRATUM RANGE (m)	MODE (m)	FILTERED (m^3)	BIOMASS (mg/m^3)
G1/6/63	21/1/63	1000	0-10	0	11.9	7
26°00'S. 110°00'E.		"	55-70	65	15.6	16
		"	100-145	125	22.3	5
		"	150-260	200	27.9	13
G1/7/63	21/1/63	2035	0-10	0	11.9	12
24°50'S. 109°59'E.		"	50-70	60	10.6	13
		"	90-160		12.1	2
		"	160-280		10.8	2
G1/8/63	22/1/63	1000	0-10	0	23.8	13
23°17'S. 110°04'E.		"	40-70	45	29.3	43
		"	80-140		29.4	10
			180-260	180	31.5	14
G1/9/63	22/1/63	2143	0-10	0	16.8	62
21°30'S. 110°00'E.		"	50-70	65	16.5	22
		"	100-125	125	22.3	12 (65*)
		"	190-240	240	26.3	8

HORIZONTAL TOWS : CLARKE-BUMPUS SAMPLER

STATION POSITION	DATE	TIME	DEPTH STRATUM RANGE (m)	MODE (m)	FILTERED (m^3)	BIOMASS (mg/m^3)
G1/10/63	23/1/63	1108	0-10	0	12.8	13 (59*)
20°00'S. 110°00'E.		"	65-70	70	15.3	36
		"	130-140	135	21.5	12 (128*)
		"	260-270	270	19.7	10
G1/11/63	23/1/63	2117	0-10	0	20.5	42 (72*)
18°30'S. 110°00'E.		"	70-75	75	18.3	62
		"	130-140	135	14.7	6
		"	255-265	260	29.0	11
G1/12/63	24/1/63	1122	0-10	0	30.1	12
17°00'S. 110°00'E.		"	40-65	45	17.2	5
		"	90-140	100	20.9	19
		"	180-220	200	25.4	9
G1/13/63	24/1/63	2133	0-10	0	15.0	38
15°44'S. 110°00'E.		"	65-75		20.4	25
		"	125-145	140	18.3	6
		"	200-260	260	23.3	7

HORIZONTAL TOWS : CLARKE-BUMPUS SAMPLER

STATION POSITION	DATE	TIME	DEPTH RANGE (m)	STRATUM MODE (m)	FILTERED (m^3)	BIOMASS (mg/m^3)
G1/14/63	25/1/63	1045	0-10	0	17.7	5
14°01'S. 110°00'E.		"	40-65	40	17.7	14
		"	75-140	140	19.6	5
		"		C.280	27.4	10
G1/15/63	25/1/63	2125	0-10	0	15.5	12
12°30'S. 110°00'E.		"	45-60	45	11.1	16
		"	90-150	150	14.8	3
		"	150-270		27.3	9
G1/16/63	26/1/63	1045	0-10	0	27.3	7
10°50'S. 109°58'E.		"	40-65	50	17.5	29
		"	75-125	110	22.5	4
		"	170-240	224-240	23.8	10
G1/17/63	26/1/63	2108	0-10	0	15.4	43
09°20'S. 110°00'E.		"	90-110	100	13.9	104 *
		"	180-200	200	36.7	10
G1/18/63	27/1/63	1435	0-10	0	22.5	12
09°00'S. 105°00'E.		"	75-120	90	46.5	6
		"	140-235	150	37.4	13

HORIZONTAL TOWS : CLARKE-BUMPUS SAMPLER

STATION POSITION	DATE	TIME	DEPTH STRATUM RANGE (m)	MODE (m)	FILTERED (m^3)	BIOMASS (mg/m^3)
G1/20/63	8/2/63	0912	0-10	0	25.3	48
09°30'S. 110°00'E.		"	40-75	65	18.1	7
		"	80-140	140	18.6	3
		"	170-260	260	17.7	4
G1/22/63	9/2/63	0900	0-10	0	37.6	13
12°30'S. 110°00'E.		"	55-65	60	20.4	36
		"	110-160	160	17.6	8
		"	210-270	230	12.3	13
G1/23/63	9/2/63	2122	0-10	0	20.0	24
14°00'S. 110°00'E.		"	50-75	55	18.1	32
G1/24/63	10/2/63	1040	0-10	0	20.8	17
15°30'S. 110°00'E.		"	50-60	50	24.2	36
		"	90-125	95	27.5	63
		"	190-220	190	31.9	35 *
G1/25/63	10/2/63	2105	0-10	0	23.7	83
17°00'S. 110°00'E.		"	50-75	55	14.1	100
		"	100-170		24.2	23
		"	200-270	200	30.2	17

HORIZONTAL TOWS : CLARKE-BUMPUS SAMPLER

STATION POSITION	DATE	TIME	DEPTH RANGE (m)	STRATUM MODE (m)	FILTERED (m^3)	BIOMASS (mg/m^3)
G1/26/63	11/2/63	1128	0-10	0	27.7	16
18°30'S. 110°00'E.		"	50-55	52	24.1	25 (59*)
		"	75-120	115	20.0	26
		"	190-220	210	37.3	12
G1/27/63	11/2/63	2108	0-10	0	30.5	24
20°00'S. 110°00'E.		"	30-50	35	27.1	19
		"	65-90	70	31.0	6
		"	140-170	150	41.6	14
G1/28/63	12/2/63	1105	0-10	0	15.8	23
21°26'S. 110°01'E.		"	75-0 +	75	13.0	40
		"	145-0 +	140	13.3	10
		"	280-0 +	270	15.2	8
G1/29/63	12/2/63	2110	0-10	0	24.8	11
23°10'S. 110°00'E.		"	40-46	45	18.1	54
		"	75-85	80	17.3	114 *
		"	161-172	171	26.6	9

HORIZONTAL TOWS : CLARKE-BUMPUS SAMPLER

STATION POSITION	DATE	TIME	DEPTH STRATUM RANGE (m)	MODE (m)	FILTERED (m^3)	BIOMASS (mg/m^3)
G1/30/63	13/2/63	1233	0-10	0	33.6	5
24°15'S. 109°58'E.		"	30-45	40	25.1	28
		"	60-80	75	30.7	26
		"	130-180	170	53.6	16
G1/31/63	14/2/63	1125	0-10	0	23.1	14
27°33'S. 110°00'E.		"	100-140	125	19.1	11
		"	205-290	247	29.1	7
G1/32/63	14/2/63	2055	0-10	0	22.8	53
28°55'S. 110°00'E.		"	45-70	55	14.9	24
		"	90-140	100	22.8	12
		"	190-260	200	26.3	9
G1/33/63	15/2/63	1123	0-10	0	19.7	11
30°25'S. 110°00'E.		"	65-75	70	18.1	19
		"	150-0	130	19.0	20
		"	260-0	250	20.5	10 (67*)
G1/34/63	15/2/63	2045	0-10	0	14.7	24 (95*)
32°00'S. 110°00'E.						
G1/35/63	16/2/63	1159	0-10	0	17.1	8
32°00'S. 111°50'E.		"	35-60		18.7	37
		"	75-115		23.5	13
		"	150-210		34.2	10 (21)

DATA

PART 6

MICRONEKTON

OBLIQUE HAULS : 5 FT ISAACS-KIDD MIDWATER TRAWL

STATION POSITION	DATE	TIME	ESTIMATED LENGTH OF COLUMN FILTERED (m)	MAX. DEPTH (m) +	DRY WEIGHT: mg for a 10,000 m* column			
					x JELLY ORG.	x PLANKTON ORG.	x MACRO-PLANKTON ORG.	x MICRO-NEKTON
G1/3/63 30°31'S. 110°01'E.	19/1/63	2254 2427	9600	190	488	2520	2863	5646
G1/5/63 27°30'S. 110°E.	20/1/63	2237 2405	11012	270	176	1320	1730	1941
G1/7/63 24°50'S. 109°59'E.	21/1/63	2231 2407	10124	270	440	1440	2475	6420
G1/9/63 21°30'S. 110°E.	22/1/63	2247 2415	9136	150	224	1800	4275	7410
G1/11/63 18°30'S. 110°E.	23/1/63	2225 2400	9784	260	256	2040	4454	2295
G1/15/63 12°30'S. 110°E.	25/1/63	2226 2358	9444	180	296	1140	3984	3831
G1/17/63 9°20'S. 110°E.	26/1/63	2208 2356	11172	220	240	1080	3756	3727

+ If no data, 200 m assumed
x Refer to explanatory notes
* 10,000 m is the length of the column filtered in the time of the average haul

OBLIQUE HAULS : 5 FT ISAACS-KIDD MIDWATER TRAWL

STATION POSITION	DATE	TIME	ESTIMATED LENGTH OF COLUMN FILTERED (m)	MAX. DEPTH (m) +	DRY WEIGHT: mg for a 10,000 m* column			
					x JELLY ORG.	x PLANKTON ORG.	x MACRO-PLANKTON ORG.	x MICRO-NEKTON
G1/21/63 11°S. 110°E.	8/2/63	2243 2415	9260	250	152	2880	2853	5026
G1/23/63 14°S. 110°E.	9/2/63	2218 2348	9320	250	192	2040	1692	2859
G1/25/63 17°S. 110°E.	10/2/63	2209 2343	9752	195	640	2880	1577	7353
G1/27/63 20°S. 110°E.	11/2/63	2212 2347	9660	195	496	3840	2974	2287
G1/29/63 23°10'S. 110°E.	12/2/63	2208 2356	11112	250	288	2040	1500	10231
G1/32/63 28°55'S. 110°E.	14/2/63	2153 2323	9598	250	144	1200	1789	2698
G1/34/63 32°S. 110°E.	15/2/63	2146 2316	9382	180	2856	1680	2500	3977

+ If no data, 200 m assumed
x Refer to explanatory notes
* 10,000 m is the length of the column filtered in the time of the average haul

TABLE 3

RELATION OF WET VOLUME TO DRY WEIGHT

The displacement volume of a group of organisms (in ml) multiplied by the appropriate factor below, gives the dry weight in mg.

	CONVERSION FACTOR
Gelatinous organisms (Medusae, Salps, Siphonophores)	8
Planktonic organisms	120
Micronektonic organisms	
Fishes	189
Fish larvae	162
Leptocephali	60
Cephalopods non gelatinous, small	137
non gelatinous, big	182
gelatinous	72
Macroplanktonic organisms	
Phyllosomas	29
Stomatopods	168
Amphipods - various	130
- Phronima group	43
Mysids	145
Euphausiids	149
Penaeids	158
Carids	231
Annelids	53
Pteropods (shell included)	267
Heteropods	10.
Chaetognaths	56

DATA

PART 6

PARTICULATE CARBON

PARTICULATE CARBON

Values are in µg/l

STATION	0 m	50 m	100 m	150 m	200 m	COLUMN * AVERAGE
1	29	43	26	16	11	26
2	63	46	28	11	6	30
3	23	30	22	11	6	19
4	17	17	18	8	6	14
5	19	19	8	8	6	12
6	23	16	13	9	6	13
7	27	17	13	10	6	14
8	22	20	17	8	4	15
9	31	23	11	6	6	15
10	38	27	20	17	13	23
11	-	-	-	-	-	-
12	17	17	11	5	4	11
13	13	15	6	6	4	9
14	-	-	-	-	-	-
15	26	17	12	6	6	13
16	17	14	6	4	6	9
17	18	23	15	6	4	14
18	27	15	10	4	6	11
19	26	19	8	8	3	12

\- Samples lost

* The column average was calculated according to Humphrey (1960)

PARTICULATE CARBON

Values are in µg/l

STATION	0 m	50 m	100 m	150 m	200 m	COLUMN * AVERAGE
20	22	16	13	8	6	13
21	15	17	13	7	7	12
22	15	13	15	5	5	10
23	25	15	9	4	5	11
24	15	13	15	5	5	11
25	19	36	9	7	4	16
26	31	24	13	4	6	15
27	18	18	15	4	4	12
28	13	20	20	7	6	14
29	17	18	9	8	5	12
30	20	16	15	9	6	13
31	23	14	13	6	4	12
32	18	15	17	4	3	12
33	17	22	11	6	3	12
34	13	18	13	5	7	12
35	16	13	18	12	8	14

* The column average was calculated according to Humphrey (1960)

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